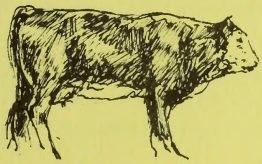
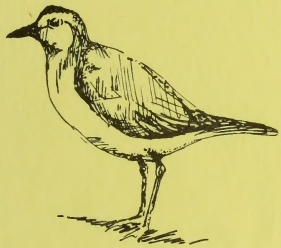
BLACK-TAILED PRAIRIE DOG

CONTROL/MANAGEMENT IN PHILLIPS RESOURCE AREA

Programmatic
Environmental
Assessment





United States Department of the Interior
Bureau of Land Management
Lewistown District — Phillips Resource Area

JUNE 1982

Dear Reader:

Enclosed is the Black-tailed Prairie Dog Programmatic Environmental Assessment (EA) which discusses the anticipated consequences of implementing three different levels of control and management of prairie dogs in the Phillips Resource Area. A prairie dog town would be controlled by poison and follow up practices to completely remove the animal, whereas, a town would be managed by determining a desired size, then maintaining the town at that acreage by periodic poisoning and/or recreational shooting. A fourth alternative is also being considered, that being to not control or manage prairie dogs.

In 30 days I will decide which alternative will become our course of future action in the Phillips Resource Area. If you have advice to offer about our assessment, please address your comments to Charles Dahlen, Area Manager, Phillips Resource Area, P.O. Box B, Malta, Montana 59538.

Thank you for your interest and concern.

Sincerely yours,

Charles S. Dahlen

Charles S. Dahlen
Area Manager

SUMMARY

The following narrative briefly describes three alternatives considered in this document for control and/or management of black-tailed prairie dogs in the Phillips Resource Area (Phillips RA). A prairie dog town would be controlled by poison and follow up practices to completely remove the animal. A town would be managed by determining the allowable acreage and not allowing population expansion through periodic poisoning, recreational shooting and other measures if applicable. A fourth alternative is also considered, that being to not control/manage prairie dogs. This document compares the environmental consequences of implementing each alternative. All other components of implementing an allotment management plan (AMP) (grazing systems, mechanical treatments, etc.) are analyzed in the *Missouri Breaks Grazing Environmental Impact Statement* (EIS), the *Prairie Potholes Grazing EIS* and the *Lewistown District Water Development Programmatic Environmental Assessment* (EA).

DESCRIPTION OF ALTERNATIVES

Alternative A, total control, proposes controlling by poisoning 96 prairie dog towns in 43 grazing allotments covering 8,275 acres on public lands in the Phillips RA within 5 years. Methods to accomplish this action consist of: amending or preparing the AMP, completing a prairie dog damage assessment report, completing other environmental clearances, preparing an EA on the AMP, poisoning prairie dog towns for control, treating mechanically or chemically (fertilizer) the towns that would not revegetate from poisoning alone, implementing grazing systems and monitoring AMPs to reach objectives. Thirty AMPs exist or would be completed under present grazing EIS schedules. An additional 13 AMPs would be completed ahead of grazing EIS schedules.

Alternative B proposes to control by poisoning, within 5 years, 81 prairie dog towns covering 7,375 acres. The remaining 15-20 towns, covering 900-1,200 acres, would be managed. Criteria used to select dog towns for control or management are presented. The proposed action would affect the 43 allotments discussed in Alternative A. Managed prairie dog towns would be included in 15 allotments. Methods to accomplish this action are the same as those in Alternative A, however, endangered species clearances and periodic poisoning would continue on the managed towns.

Alternative C proposes to control by poisoning, within 5 years, 63 prairie dog towns covering 5,630 acres. The remaining 30-35 towns, covering 2,500-2,900 acres, would be managed. Criteria used to select dog towns for control or management are presented. The proposed action would affect the 43 allotments discussed in Alternative A. Managed towns would be included in 27 allotments. Methods to accomplish this action are the same as those discussed in Alternative B.

Alternative D proposes no control of prairie dogs on public lands in the resource area. A worst case situation for analysis suggests a potential for a 27% expansion rate per year by prairie dogs by the end of the long term. Thirty AMPs would be completed under the EIS schedule. Additonal AMPs would not be completed ahead of EIS schedules. Recreational shooting would be the only method of control. The AMPs would be implemented without concern for prairie dog control and/or management.

COMPARISON OF ALTERNATIVES

The control/manage alternatives (A, B, C) would benefit most of the environmental components analyzed. The degree of benefits would be in proportion to the acres of prairie dogs controlled. Soils, watershed and vegetation would benefit the most. These benefits would be a significant contribution to an operator whose allotment contains a large proportion of public lands with prairie dog towns.

It's also anticipated that most game species would benefit from implementation of one of these three alternatives.

The negative consequences from control/management would be most significant to the prairie dogs themselves plus the animal species closely associated with prairie dog towns.

Alternative A would significantly impact the recreationist (the most prevalent user is the sport shooter) by removing the object of his sport. Alternatives B and C would impact the recreationist less, as some towns would remain.

Selection of Alternative D, not to control/manage prairie dogs, would allow the significant negative impacts occurring to soils, watershed and vegetation to continue, but at a greater magnitude. This could dramatically affect the livestock operator who is dependent on public lands for a large part of his operation, if those lands become infested with prairie dog towns.

Prairie dogs and associated species would benefit from Alternative D, as would the recreationist.

HOW THIS DOCUMENT IS TO BE USED

If the decision is made to implement one of the control/manage alternatives (A, B or C), then this document would function as a reference document each time an AMP was developed that deals with control or management of prairie dogs. It would be programmatic in nature. This means that it pertains to repetitive, similar actions.

Environmental reporting on individual proposed actions would be by reference to the program EA with supplements or refinements if a specific action was exceptional and was not anticipated in the programmatic. The analysis process would be documented by an EA cover sheet placed in our EA chronological file. The cover sheet would reference this program EA plus other program EAs that deal with other actions involved in implementing a particular AMP (i.e., construction of reservoirs) and would also contain attached exception analysis if needed. Consequences of any actions not covered by reference documents would also be included but would be documented in individual site-specific EA format.

The EA, cover sheet, exception analysis and any additional site-specific documentations would be made available to anyone wishing to inspect the analysis performed for each project or for the AMP in general.

Of course, if Alternative D is selected to not control/manage prairie dogs, then the utility of this document as a programmatic EA would not be necessary.

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

Lists of the vegetation and animal species common to the Lewistown District are found at the end of this document.

CHAPTER 1
INTRODUCTION

As part of its multiple use management, the Bureau of Land Management (BLM) must manage public lands in a manner that maintains or improves the natural resources, including soil, water, vegetation and wildlife habitat. The BLM's principal authority to manage public lands is found in the Taylor Grazing Act of 1934, and the Federal Land Policy and Management Act of 1976, as amended by the Public Rangelands Improvement Act of 1978.

The allotments discussed in this document are included in the *Missouri Breaks* or *Prairie Potholes Grazing Environmental Impact Statement* (EIS) which contain analysis of the environmental consequences of BLM's management of livestock grazing on public lands. The purpose of the range management program proposed in the *Missouri Breaks Grazing EIS* is to "improve or stabilize range conditions while providing livestock forage for dependent users, protecting watershed values through reduction of erosion and enhancement of water quality, protecting and enhancing wildlife habitat and safeguarding other environmental values" (*Missouri Breaks Grazing EIS*, page 1-1).

The purpose of the range management program proposed in the *Prairie Potholes Grazing EIS* is to develop a livestock grazing program consisting of vegetation allocation, necessary to equitably allocate the vegetation among competing consumptive uses, and implementation of grazing treatments and range improvement projects to maintain or improve vegetation yields and watershed conditions (*Prairie Potholes Grazing EIS*, page 1).

The *Missouri Breaks* and *Prairie Potholes Grazing EISs* and the *Phillips Resource Area's Management Framework Plan* (MFP) have identified resource values and conflicts associated with prairie dogs. Early plans identified the prairie dog as a valuable resource, whose towns provided a unique habitat for a variety of wildlife species. However, by 1974, an MFP update indicated that prairie dogs had become a problem in some allotments by spreading over many acres of rangeland, reducing vegetation production and increasing soil erosion. The towns also provided substantial recreational value because sport shooting of prairie dogs has become a frequent and popular past-time for local residents as well as many out-of-staters.

Grazing permittees have asked that BLM control or slow the spread of prairie dogs. BLM also realized that range restoration must be tied to an overall rangeland improvement program, such as an AMP which would include management practices in addition to prairie dog control. Just poisoning prairie dogs would merely provide short-term benefits and not improve rangeland productivity in the long term.

The *Missouri Breaks* and *Prairie Potholes Grazing EISs* discussed an overall program of range restoration which would improve all natural resources. The EISs intended the AMP on selected allotments to be the program document prescribing the manner of livestock use to meet the multiple use objectives of the allotment. The AMP would include a grazing system to improve or stabilize range condition, along with any additional range facilities, (waters, fences, etc.) mechanical treatments, and prairie dog control by poisoning when necessary to achieve the objectives of the AMP.

PURPOSE AND NEED

BLM is required to prepare an Environmental Assessment (EA) on its management actions which may affect the environment in compliance with the National Environmental Policy Act of 1969 and the Council on Environmental Quality Regulations.

Two terms, control and manage, are used in this document to discuss the impacts on prairie dog towns. A definition of each is necessary to clarify the intent of each term. A prairie dog town would be controlled by poison and follow up practices to completely remove the animal from an existing location. In contrast, a prairie dog town would be managed by determining an acreage and then maintaining the town at that acreage by mechanical treatment barriers, vegetative barriers, periodic poisoning and/or recreational shooting.

The purpose of this EA is to analyze anticipated resource and economic impacts from implementing prairie dog control and/or management as AMPs are developed or revised in Phillips RA. Most of the environmental consequences of implementing such AMPs are thoroughly assessed in the *Missouri Breaks Grazing EIS*, the *Prairie Potholes Grazing EIS* and the *Lewistown District Office Water Development Programmatic EA*. Therefore, impacts from range improvement projects and grazing management will only be discussed as they relate to prairie dog ecology. Impacts from poisoning and managing prairie dogs have not been previously and/or adequately assessed in other existing documents, thus, the emphasis of impact discussion will relate to analysis on this portion of AMP implementation.

SETTING

The proposed action takes place in Phillips Resource Area (Phillips RA), a detached office of the BLM's Lewistown District (Figure 1). For descriptive purposes the Phillips RA consists of all lands within the boundaries of Phillips County but excludes the Charles M. Russell National Wildlife Refuge (CMR) and the Fort Belknap Indian Reservation. The Phillips RA includes approximately 1.1 million acres of public lands intermingled with 2.2 million acres of private and state lands. The resource area, not the county is the land unit discussed in this analysis. However, one exception exists in the Social and Economic Conditions section where data is based only on county figures. There is very little difference in size (acres) between the county and resource area and therefore no significant differences would exist as the county data is used synonymously as Phillips RA data.

Phillips RA is located in north-central Montana and BLM administers more than 1.1 million acres (36%) of the land in the resource area. The major land uses include livestock grazing (cattle and sheep) and/or farming of small grains and hay. BLM administers 360 grazing allotments in the resource area.

BLM knows of at least 173 prairie dog towns covering about 11,555 acres in Phillips RA. On public lands, we know of 96 prairie dog towns covering 8,275 acres within 43 allotments (Table 1). These and any additional towns found on public lands in the resource area are evaluated by this document and would be controlled and/or managed under a selected action as AMPs are revised or completed.

We also know of at least 77 dog towns on private and state lands. Although BLM has no jurisdiction over these towns, cooperation will be sought on control and/or management as AMPs are developed or revised. This document will not analyze the impacts on private or state lands, however, the impacts would be similar.

On a regional basis it is insignificant that 8,275 acres out of the 1.1 million administered by the Phillips RA are covered by prairie dog towns. However, there are some permittees with large portions (up to 69%) of their allotments covered by these towns. These permittees, and neighboring allotments, are bearing the brunt of present damage and will be the first to bear the brunt of possible prairie dog expansion. The emphasis of this EA is on these allotments, not on the overall percentage of the resource area covered by dog towns.

BACKGROUND

Prairie dog control is not new in the resource area. Lewis and Clark noted prairie dogs (barking squirrels) on the Missouri River in 1805. According to records of the county extension agent which date back to 1917, rodent control has always been a concern (Table 2). The Richardson ground squirrel (the "gopher") was a problem in the 1920s and 1930s on cropland. The black-tailed prairie dog was first identified as a range pest in 1924. However, no real intensive action took place to control prairie dogs until 1931. Strychnine oats were spread over 170,000 acres of rangeland from 1931 to 1933. The poisoning was very successful and the 1933 report mentioned that very few prairie dogs were left in the county. Poisoning continued on the few remaining towns until 1939 when it was felt that prairie dogs had been eliminated from Phillips County.

A key factor providing prairie dogs a foothold in the area was probably grazing abuse around the late 1800s. BLM has not controlled prairie dogs in the resource area since its inception in 1946 and it's now evident that prairie dogs again exist and are spreading. Range condition on public land has generally improved since 1900 through improved grazing management under AMPs. However, vegetative response is hampered by drought conditions and unproductive soils. Intensive grazing management has required construction of approximately 4,200 water sources and many miles of fence which are connected by a network of roads and trails. These roads and trails, along with soil disturbing activities, and short grass prairies continually provide the habitat and travel routes for rapid prairie dog expansion (Knowles, 1980, personal communication).

In the early 1970s some grazing permittees began asking that BLM control or slow the spread of prairie dogs, while others asked for complete eradication. BLM also realized that any long-term range restoration must be tied to an overall rangeland improvement program. As mentioned in the introduction, the 1974 MFP update identified conflicts between prairie dogs and other natural resources especially soils and watershed.

FIGURE 1. BLACK-TAILED PRAIRIE DOG TOWNS FOUND ON PUBLIC LANDS IN PHILLIPS RESOURCE AREA.

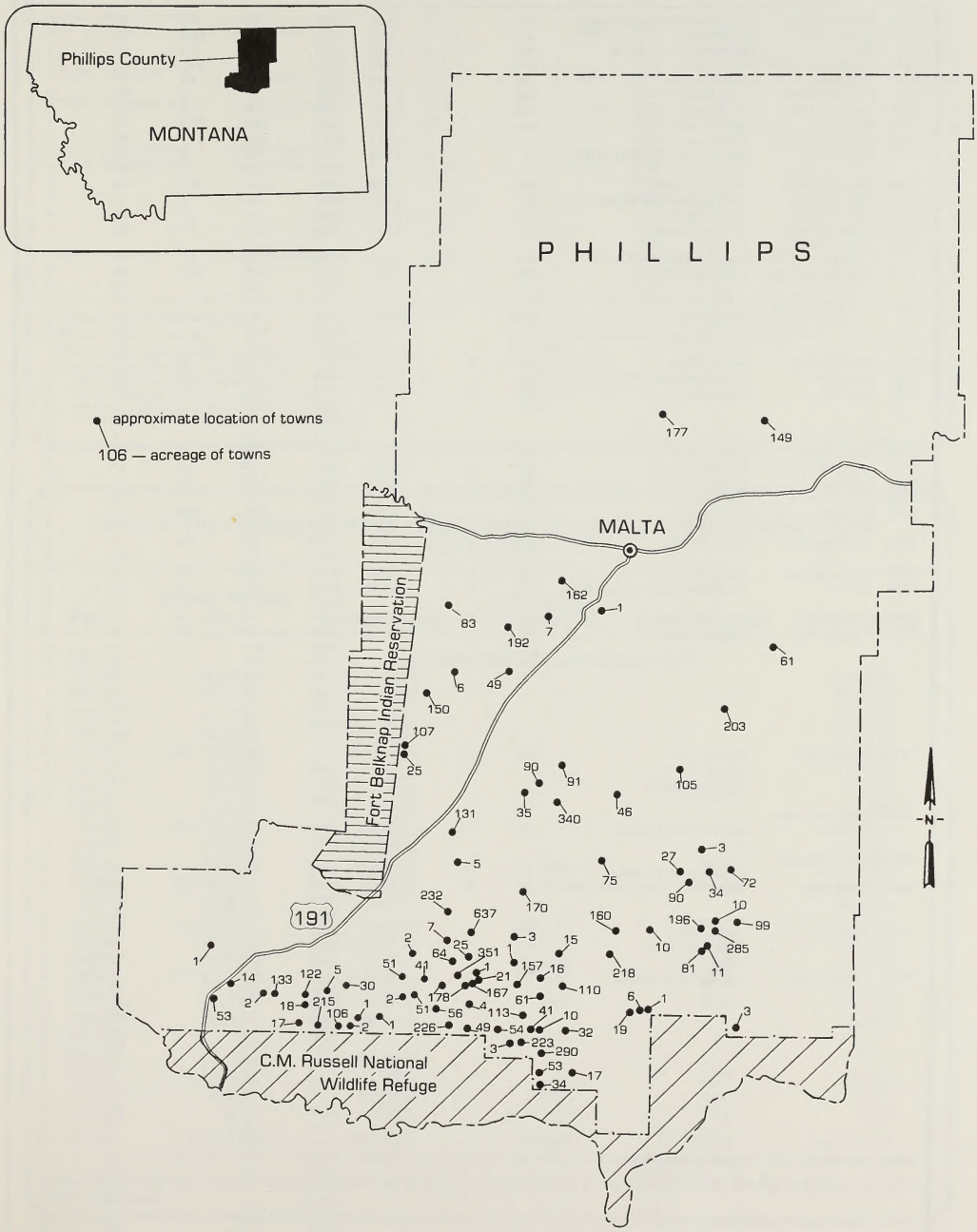


TABLE 1: BLACK-TAILED PRAIRIE DOG TOWNS LOCATED ON PUBLIC LANDS IN PHILLIPS RESOURCE AREA

Number	Allotment	Operator	** AMP Status	EIS Area MRB[1]	EIS Area PPH[2]	BLM Acres[3]	Town Number[4]	Town Size	% Public Land in Allotment Covered by Prairie Dogs	Soil Mapping Unit	Dominant Soil Subgroup
5112	Bughouse Coulee	Cottonwood Grazing Association	Non		X	1,836	1420	177*	9.6	42	10
5308	McNeil Slough	Larry Simpson	Non		X	215	1722	149*	69.3	52	9
5328	Rocky Point	Sid Hould & Tom Anderson	Non		X	1,809	0999	83	4.6	15	1
5333	South Dodson Canal	Agnes Young	Non		X	40[5]	3109	162*	23.1	45	1
5357	Rock Corral	Lazy D Diamond	Non		X	1,528	3392	61	4.0	47	1
5369	South Alkali Creek	F. Lee Robinson	Non		X	2,420	1099	1	.0	44	5
5374	Half-way Coulee	Hould Family	Pro		X	2,210	1398	7	.3	15	1
5376	Nice Pond	Donald Hould	Non		X	756	2198	192*	25.4	15	1
5384	North Wild Horse	Ernest Wilke	Pro		X	1,277	2087	150*	11.7	39	2
5387	West Alkali	Milk River Land & Cattle Company	Ex		X	9,614	1187	6	.6	14	2
							1088	49		39	2
5398	North DHS Creek	William Anderson	Non		X	569	2581	203	35.7	39	2
5415	Overflow Coulee	R & R Spencer Land & Livestock Inc.	Ex	X		8,446	0860	46*	.5	6	10
5416	Sanford Coulee	Lazy JS Ranch	Pro		X	12,448	3379	91	.7	39	2
5417	Whiterock Coulee	Lee & Adam Koss	Ex		X	17,916	1669	340*	1.9	39	2
5420	Big Warm Spring Creek	Taylor's Tee Bar Ranch, Inc.	Non		X	1,129	0669	90*	8.0	15	1
5423	South Spring Coulee	Walter Norman	Non		X	522	1476	107*	25.3	39	2
							1376	25*		39	2
5424	Little Warm Spring Creek	Steven Page	Pro		X	11,819	1268	35	2.8	39	2
							2558	170		39	2
							3567	131		42	11
5427	North Flat Creek	William French	Ex	X		16,431	3371	105*	.6	39	2
5437	Sage Creek	Watson Brothers	Ex		X	3,125	1852	72*	2.3	9	3
5439	Flat Creek	Don Holzhey	Ex	X		13,042	2151	90	1.2	15	1
							1751	27		9	3
							1451	34		15	1
							0351	3		9	3
5446	Parrot Coulee	Patrick Emond	Non		X	2,737	1257	5	.2	43	1
5450	First Creek School	Blunt Ranches Inc.	Ex	X		1,120	2849	15*	1.3	14	2
5452	Long Coulee	Veseth & Veseth	Ex	X		8,221	1640	160*	1.9	15	1
5453	Stratton Coulee	Edwin Koss	Ex	X		8,100	1240	10	.1	15	1
5454	Dog Creek	William French	Ex		X	2,025	1241	285	14.6	15	1
							0141	10		15	1
5455	Lower Dog Creek	Vance Spencer	Ex	X		3,075	1441a	81*	3.0	15	1
							1441b	11		29	2
5457	Upper Dog Creek	May Grimsley	Ex	X		3,593	0842	99*	2.8	4	13
5612	Cyprian	Square Butte Grazing Association	Pro	X		9,133	1834	53	.6	5	4
							2044	1		18	5
5613	Camp Creek	Matador Ranch	Ex	X		3,010	0836	30	1.0	14	2
5615	West Dry Fork	Matador Ranch	Ex	X		14,854	2947	2*	5.3	13	2
							0137	351		13	2
							0838	167		9	3
							0738	178		9	3
							1938	4		27	1
							0538	1		27	1
							0538	21		14	2
							3647	64*		29	2
5617	East Dry Fork	Manson Frye	Ex	X		18,032	1141	196	4.8	4	13
		Francis Jacobs					1848	637		27	1
		Clarence Jacobson					2347	7		14	2
							3048	25		9	3
5620	Upper Fourchette Creek	Lazy JD Cattle Company	Non	X		3,269	1238	157*	4.8	13	2
							3548	1*		14	2
5623	Upper Seven Mile Creek	Lazy JD Cattle Company	Ex	X		3,809	1335	5	1	29	2
5625	Lavelle Creek	Square Butte Grazing Association	Ex	X		9,691	0934	14	1.5	14	2
							1334	2		27	1
							1835	133		27	1
5626	Rock Creek	James Kelsey	Pro	X		5,510	2235	18	5.7	29	2
		Charles Schwenke					3335	173		14	2
							1535	122*		14	2
5627	Nichols Coulee	Lazy JD Cattle Company	Ex	X		28,078	3535	215	3.5	14	2
							3136	106		27	1
							3236	2		29	2
							2836	1		29	2
							2237	56*		13	2
							1737	76		29	2
							0637	51		14	2
							0437	41		16	1
							1137	178		27	1
							2636	1		29	2
							3137	12		13	2
							0247	232		4	13
5628	Beauchamp Creek	Lazy 69 Cattle Company	Ex	X		11,955	3138	49	2.8	9	3
							3438	54		27	1
							1348	3		19	1
							0228a	3		19	1
							3637	226*		13	2
							1837	2		29	2

TABLE 1 (cont.)

Number	Allotment	Operator	AMP Status**	EIS Area MRB[1]	EIS Area PPH[2]	BLM Acres[3]	Town Number[4]	Town Size	% Public Land in Allotment Covered by Prairie Dogs	Soil Mapping Unit	Dominant Soil Subgroup
5651	North Fourchette Creek	Blunt Ranches Inc.	Ex	X		5,200	0539	16	3.6	14	2
							1039	110*		14	2
							1739	61		14	2
5652	Third Creek	Roger Ereaux	Ex	X		10,001	0730	75	2.9	14	2
							2940	218		14	2
5654	Telegraph Creek	Wiederrick Brothers	Ex	X		11,412	2230	19	.2	13	2
							2330	6		9	3
							2430	1		9	3
5656	Upper Lonetree	Charles Barnard	Non	X		554	0732	3	.5	15	1
5662	Fourchette Creek	Loving U Ranch Inc.	Pro	X		19,049	2538	113	2.3	14	2
							3139	41*		14	2
							2329	17		9	3
							3239	10		14	2
							3439	32*		14	2
							0128	223*		19	1
5663	First Coulee	Veseth & Veseth	Pro	X		3,771	0829	290*	10.0	14	2
							2029	53*		27	1
							2929	34		27	1

[1]Missouri River Breaks Grazing EIS.

[2]Prairie Potholes Grazing EIS.

[3]Acres of public lands which BLM administers in the allotment.

[4]The number containing the legal description:
the first two numbers are the section,
the third number is the last number of the township,
the fourth number is the last number of the range.
Example: T. 25 N., R. 30 E., Section 16 would be #1650.

[5]Does not include Bureau of Reclamation land within the allotment.

*The town has some intermingled State or private land within its boundary.

**AMP Status
Non — Non-AMP
Pro — Proposed AMP
Ex — Existing AMP

TABLE 2: THE RODENT CONTROL PROGRAM IN PHILLIPS COUNTY, MONTANA FROM 1917-1939[1]

Year	Gopher Poison (lbs.)	Acres Treated	Prairie Dog Poison (lbs.)	Acres Treated	Total Savings
1917		Educational and Demonstrational Work			
1918	20,000	200,000			20,000
1919	58,000	580,000			58,000
1920	42,000	420,000			42,000
1921	28,500	285,000			28,500
1922	12,000	120,000			12,000
1923	9,100	91,000			9,100
1924	6,500	65,000		6,500	6,500
1925	10,200	102,000			10,200
1926	16,280	162,800			16,280
1927	11,682	116,820			11,682
1928	12,360	123,600	882	800	12,760
1929	16,308	163,080	864	800	16,708
1930	15,507	155,070			15,507
1931	13,785	137,850	48,110	68,000	47,785
1932	10,796	107,960	9,500	38,000	29,796
1933	17,392	173,920	15,000	64,000	49,392
1934	16,150	161,500	245	250	16,275
1935	13,766	137,660	260	280	13,906
1936	6,874	68,740			6,874
1935-36 (gov't.)	12,000	120,000			
1937	15,900	242,800	60	200	8,242
1938	4,760	62,000	100	180	805
1939	810	9,720	20	15	125
TOTAL	370,670	3,806,520	75,041	172,525	$432,437

[1]Data obtained from Phillips County Extension Agent Annual Reports from 1917-1939. On file in Extension Office, Malta, Montana.

The *Missouri Breaks Grazing EIS*, covering the extreme southern portion of the Phillips RA was completed in 1979 and did not adequately discuss prairie dog control and/or management. However, the EIS did recommend that site-specific problems (i.e. prairie dogs) be handled by an interdisciplinary team during AMP implementation or revision.

Concurrent with the preparation of the *Missouri River Breaks Grazing EIS* was the preparation of the *Draft Prairie Dog Habitat Management Plan* (HMP). The Draft HMP was prepared in 1979 in an effort to address the prairie dog issues in Montana and identified the south portion of Phillips RA as the primary area for implementing prairie dog management. In April of 1980, as a result of the draft, a *Prairie Dog Habitat Management Policy Statement* (Appendix 1) was issued by the BLM Montana State Director. The policy recognizes the prairie dog ecosystem as an integral part of the prairie environment and its perpetuation should be consistent with multiple use management of public lands. Specifics of the policy state that BLM should:

1. Select prairie dog towns that will be maintained at a determined level to support a viable population of prairie dogs for public use.
2. Select prairie dog towns that will be maintained at a determined level to provide habitat for associated wildlife species.
3. Select prairie dog towns that will be maintained at a determined level to provide habitat for species designated as threatened or endangered by Federal and state laws.

Towns not selected for the maintenance of a prairie dog population, other associated wildlife species, or threatened or endangered species may be controlled. Where prairie dogs are reported to damage public rangelands BLM should:

1. Document, through field investigation, unacceptable prairie dogdamage to public resources.
2. Intensively inventory for Federal Threatened and Endangered Species and Species of Special Concern to Montana Department of Fish, Wildlife and Parks (MDFWP).
3. Coordinate control plans with appropriate state and Federal agencies.

After the *Prairie Dog Habitat Management Policy Statement* of April 1980 was issued, procedures were developed in December of 1980, and field tested in June of 1981 to survey prairie dog towns for resource damage, presence of Federal Threatened and Endangered Species, and Species of Special Concern to MDFWP (Appendices 1 & 2). A summary of these procedures follows:

Prairie dog damage is determined by selecting, measuring and evaluating three representative range sites associated with each prairie dog town: inside the town, adjacent to the town perimeter in comparable soils and at a comparison area. The purpose of sampling is to document the soils series and range conditions inside the town where conditions may be influenced by both prairie dogs and livestock; beyond the town perimeter where conditions are largely influenced by livestock; and at a comparison area where good/excellent range condition is maintained with grazing management. The range condition of the comparison area will be the management model by which the trend of the subject town is evaluated. Range condition elements to be evaluated on the three sites are: vegetation canopy coverage; range condition and trend; forage production and trend; utilization, wildlife habitat condition and trend; erosion, water infiltration, and runoff. A summary is then prepared and includes an evaluation of reported damages, any unacceptable conditions verified from the field examination, probable causes of any rangeland deterioration and recommendations for corrective management.

Three vertebrates closely associated with prairie dog towns in Montana require special management attention. These species are the black-footed ferret, listed as an endangered mammal pursuant to the Endangered Species Act of 1973; the mountain plover; and the burrowing owl. The latter two are birds listed as vertebrate Species of Special Concern by the MDFWP.

Inventory for the black-footed ferret would involve two levels of examination. The first level is an extensive daytime survey of each prairie dog town to determine the existence of ferret activity. Optimum period for ferret inventory is between July 15 and September 1. The second level of inventory consists of an intensive nighttime search to locate ferrets. This effort would be applied to the entire town where evidence from the extensive inventory indicated ferret occupation. If no evidence was observed, no further ferret surveys would be warranted for 12 months. As new techniques for surveying for black-footed ferrets are developed and approved by the USFWS they will be used in the selected program.

Burrowing owls and mountain plovers are inventoried by an extensive daytime survey of each prairie dog town to identify nesting sites and summer habitat. The optimum period for these inventories is from May 15 to July 15.

Prairie dog control and/or management was again assessed in general terms by the *Prairie Potholes Grazing EIS* completed in 1981. This EIS covers all allotments north of the *Missouri Breaks Grazing EIS* boundary in the resource area. The EIS states that the *Montana Policy Statement of 1980* would guide prairie dog control and/or management on public lands in the EIS area. This EIS, like the *Missouri Breaks Grazing EIS*, states that an interdisciplinary team would assess the problem on specific allotments as needed during AMP development or revision.

Implementation of AMPs that have resource problems for which prairie dogs are a significant contributing factor would not be feasible without initiating some form of prairie dog control as the first step. Thus, the Long Coulee Allotment, in the southern portion of the Phillips RA was selected in 1981 as a pilot project for a concerted effort in rangeland restoration. Prairie dog expansion had been severe and was recognized in the proposed AMP and *Missouri Breaks Grazing EIS* as a principal contributor to range deterioration. The 1981 range survey placed most of the allotment in good to excellent range condition with the exception of those areas within prairie dog towns, which were in fair and poor condition. Good ecological range condition, stocking below capacity and a three pasture rest rotation grazing system did not stop the spread of prairie dogs. Plowing of a prairie dog town on private land in the allotment in 1978 did not reduce or eradicate the town but caused the prairie dogs to move, creating two new towns.

During development of the Long Coulee AMP, various interest groups expressed a concern with the BLM's intention for long range prairie dog control and/or management in Phillips RA. In order to evaluate a long range program, information was needed on the location and size of all prairie dog towns present on public lands. BLM updated its information in 1981 and asked the permittees for their assistance.

Public involvement is a very important element in all BLM decisions. Therefore, a panel of specialists was convened on December 10, 1981, to help shape the alternatives in this document. The panel consisted of representatives of Fish and Wildlife Service (FWS), Charles M. Russell National Wildlife Refuge (CMR); USDI, Bureau of Indian Affairs (BIA); MDFWP; Montana Department of Agriculture; Montana Audubon Society; local landowners; local ranchers; local planning board; a varmint shooter; and USDI, BLM Lewistown District Office and Phillips RA. The panel discussed the anticipated impacts of the two extremes, total control and no action, and developed criteria to assist BLM in developing one or more additional alternatives. These criteria were developed with a high and low range, depending on the preference or tolerance of the livestock operator group and the environmentalist/recreationist group. These criteria consisted of town size (20-320 acres), number of towns per township (1-3), public access (1-10 miles), encroachment onto private or state lands (.25-1.00 miles), percent of public lands acres in an allotment covered by prairie dogs (.5-1.5%), new towns should be poisoned first, towns near CMR should have high priority as managed towns and managed towns left for shooting should be properly located for public safety. These criteria were used to develop Alternatives B and C. The most important criterion separating these two alternatives was the percent of acreage in an allotment covered by prairie dog towns. The remaining criteria were then applied to both Alternatives B and C.

Other criteria in the selection of managed towns would be the discovery of evidence of Endangered or Threatened Species (black-footed ferret) or a high concentration of Species of Special Concern. Decisions about the importance of this discovery in relation to how a prairie dog town is managed will be made at the time the evidence surfaces. In the case of endangered and threatened species, consultation with the United States Fish and Wildlife Service (USFWS) would be required.

Another consideration for the selection of a managed town that should be applied as an AMP is developed is the slope gradient present on a given prairie dog town. Towns with a low slope gradient would have less water erosion (less surface damage) and should have a higher consideration for management.

The panel agreed that poison is very likely the only effective method now available for the control of prairie dogs. The environment of Phillips RA, representative of the short grass prairie, does not contain the climate, soils, and vegetation that would provide deterrents to prairie dog expansion as they might in other areas. Prairie dogs depend on sight as their principal defense against enemies, and where vegetation prevents their use of this defense they will not remain. Range management practices that have led to this level of tall and dense vegetation, in environments where this growth is possible, have met with some success in impeding growth of prairie dog towns (Koford, 1958). However, the panel generally felt that these methods would not be successful in Phillips RA, and that the time element necessary to determine success rates of range management practices make it unrealistic for BLM to pursue these methods, except perhaps on a small study plot basis. In the UL Bend of the CMR there are static or slowly expanding towns in an area rested from livestock grazing for 12 years. Some of these towns have decreased in size while others have and are continuing to expand, even into tall sagebrush. Some of those towns decreasing in size appear to be surrounded by unlimited suitable habitat. Steeply sloping terrain appears to be the major limiting factor against prairie dog town expansion on the CMR (Fortenbery, D., 1982, personal communication). Grazing systems and mechanical treatments may be used as follow up management but should not be the initial method for improving range condition on prairie dog towns.

A number of assumptions were developed by the panel and BLM personnel to make analysis of the alternatives clearer. These are:

1. All prairie dog management on public lands would be carried out during implementation or revision of an AMP.
2. Prairie dog management is only one of many tools used in meeting the objectives for implementing an AMP.
3. Zinc phosphide is the only chemical rodenticide approved by the U.S. Environmental Protection Agency (EPA) and USDI-FWS for controlling prairie dogs on public lands. This poison would be used on prairie dog towns over 5 acres in size. Gas cartridges or phostoxin tablets are approved by the above agencies for fumigation on public lands and would be used on prairie dog towns of less than 5 acres.
4. This document is tiered upon the *Missouri Breaks* and *Prairie Potholes Grazing EISs* for all range management practices except prairie dog control and management.
5. Adequate manpower, money, fuel and materials would be available to implement the management process.

CHAPTER 2
THE ALTERNATIVES

Four alternative programs are analyzed in this environmental assessment (EA) to provide readers and decision makers a means of examining the various impacts of each alternative. These programs are Alternative A, Total Control; Alternative B, Management Level I (managing 15-20 prairie dog towns covering 900-1,200 acres); Alternative C, Management Level II (managing 30-35 prairie dog towns covering 2,500-2,900 acres) and Alternative D, No Action.

Alternatives A, B and C include varying intensities of prairie dog control. All control would be done under a site-specific, long-term allotment management plan (AMP). The AMP would contain a cooperative natural resource improvement program. This plan would include a grazing system, any needed range improvements (water or fences), prairie dog control and/or management and any needed mechanical treatments. The procedure for implementing an AMP would proceed as follows:

A. The permittee, the Bureau of Land Management (BLM) and others concerned would cooperatively determine the full potential of the allotment for livestock production, watershed protection and wildlife habitat, as provided for in Section 8 of the Public Rangelands Improvement Act.

B. A grazing system would be selected by the two parties which would compliment the full potential in the allotment, on an annual sustained basis.

C. Additional water sources and fences could be necessary to implement the grazing system.

D. Prairie dog control and/or management would be identified during the initial meetings and from the damage assessment procedure conducted by BLM. Prairie dog control with zinc phosphide would follow the procedures generated by the Montana BLM Prairie Dog Policy of 1980. The procedure would be as follows:

    1. A damage assessment would be made of vegetation and soil on each prairie dog town following the procedure described in Appendix 2.

    2. An inventory would be made for Species of Special Concern (burrowing owl and mountain plover) between May 15 and June 15 as described in Appendix 3.

    3. A clearance would be made for the endangered black-footed ferret between July 15 and September 1 as described in Appendix 3. No action would be taken to control prairie dogs until consultation was completed with the U.S. Fish and Wildlife Service (FWS), as required by Section 7 of the Endangered Species Act.

    4. After the above procedures and analysis are completed a decision would be made whether to poison a prairie dog town with zinc phosphide, following EPA and FWS directions. This procedure would be:

        a. Prebait each prairie dog mound with 1 teaspoon (4 grams) of untreated oats one to two days prior to baiting. This would increase acceptance of treated bait by prairie dogs.

        b. Establish a study plot of 200 m x 200 m during prebaiting to monitor prairie dog activities before and after poisoning. This would provide data on the success of the control.

        c. Apply bait after most or all of the prebait was eaten in the study plot.

        d. Apply bait as a six-inch bait spot on the edge of each mound or in adjacent feeding area.

        e. Application rate should not exceed 1 teaspoon (4 grams) per bait spot.

        f. Treatment would be done during late summer to late fall (July-December), depending upon weather conditions.

        g. Do not apply more than one bait application during this period.

5. Follow up control would be necessary when total control is desired. Various follow up procedures would be used. These include:

   a. Gas Cartridges

      Poisoning with zinc phosphide usually results in a 90-95% kill (Sullins, M., 1977, 1980). Gas cartridges would be used to fumigate remaining prairie dogs, when the town is 5 acres or less. The procedure for using gas cartridges is as follows:

      (1) Find the remaining active burrows. These are found through visual observations of prairie dogs or soil movement around burrows by remaining dogs two or three days after the initial poisoning.

      (2) Perforate, light and roll a cartridge down the active burrow.

      (3) Once smoke is seen in the burrow, quickly plug the burrow with soil.

      (4) Place cartridges in several burrows in close proximity to the active burrow as discussed in (b) and (c) above.

   b. Phostoxin

      Phostoxin could be used instead of gas cartridges. The procedure for using phostoxin is as follows:

      (1) Find the remaining active burrows as discussed above under gas cartridges.

      (2) Place 2-4 tablets in burrow.

      (3) Place a wad of newspaper over the tablets. This will prevent covering the tablets and retarding their release of hydrogen phosphide gas.

      (4) Plug burrow openings with soil and seal as tightly as possible.

   c. Second Poisoning

      A second poisoning would be necessary when the initial poisoning is less than 90% effective and the remaining populated acreage is greater than 5 acres. A 90% reduction in the prairie dog population is necessary to achieve satisfactory results. A success rate of less than 90% would result in the rodent population returning to or exceeding its original level within one reproductive season (Marsh, 1967). Circumstances such as bad bait, unexpected wet weather, prairie dogs not eating the bait, etc. would reduce the poisoning success. A second poisoning would usually be done a year after the initial poisoning. However, if dry weather exists the following spring, poisoning could be done before the birth of the young (Sullins, M., 1982, personal communication). Poisoning again shortly after the initial effort is not recommended because the dogs become accustomed to the bait and avoid it.

   d. Recreational Shooting

      Varmint shooting would be encouraged to help eliminate the animal from the designated location. If only a few animals were left, shooting would be the quickest and most effective method of follow up.

   e. Mechanical Treatment

      A variety of mechanical treatments could be used after the control process to rehabilitate the dog town. Certain towns would require mechanical treatments (scalping, contour furrowing or chisel plowing) and/or chemical treatment (fertilization).

6. Prairie dog towns selected for management would follow these procedures:

   a. Determine the town or towns to be left in the allotment.

   b. Determine the size of the managed town or towns.

   c. Towns which need reducing would follow the procedures outlined above for prairie dog control.

   d. Methods of reducing the town to the desired level could include:

      (1) Periodic Poisoning

      Periodic poisoning with zinc phosphide would be used to limit the spread of prairie dogs on towns selected for management. Poisoning could be done on the entire town reducing the acreage by as much as 90%. Then the town would be allowed to expand back to the desired size. This procedure should require poisoning every 3-5 years.

      (2) Recreational Shooting

      Varmint hunting would be encouraged to help maintain the size of existing towns. A signing program would be necessary to direct shooters to prairie dog towns. Maps would be updated to show the location of all dog towns. Periodic rest from shooting may be required to provide quality hunting and maintain desired town size. If needed, this would be accomplished through public notices and signing of managed towns.

The alternatives are described in both the short and long term. The short term is a 5 year implementation period during which all proposed actions would take place including prairie dog control and/or management, mechanical treatment, construction of range facilities and initiation of a grazing system. The short term would begin in 1982 and end in 1986. All responses to range development would be assumed to take place in the long term during a 10 year period after implementation of an alternative. The long term would begin in 1987 and end in 1996. Although a few soil subgroups respond rapidly to management practices and/or land treatments and could be expected to respond sooner, all response is analyzed as taking place in the long term.

ALTERNATIVE A TOTAL CONTROL

DESCRIPTION OF MANAGEMENT

Alternative A proposes to completely control, by poisoning, 96 prairie dog towns covering 8,275 acres on public lands in Phillips Resource Area (Phillips RA). The action would take place over a 5 year period.

This alternative would affect 43 allotments (Figure 2 and Table 1). Twenty-two of the allotments have existing AMPs which would require an amendment to reflect the proposed action. Eight of the allotments would be completed following the AMP implementation schedule for the *Missouri Breaks* and *Prairie Potholes Grazing Environmental Impact Statements* (EISs). The remaining 13 allotments are not scheduled for an AMP at this time but would be completed before any control and/or management.

During the poisoning process, prairie dogs would continue to expand on the untreated acres. We are using for analysis purposes a *worst* case acreage expansion rate of 27% per year that existed at Buffalo Gap National Grasslands, South Dakota from 1966 to 1978 (Tiegan, H. 1980. U.S. Fish and Wildlife Service. personal communication). In 1972 observations indicated there were less than 1,000 acres of prairie dog towns in the resource area (Harry Cosgriffe, Area Manager. 1982. Dillon Resource Area. personal communication). Ten years later, the Phillips RA has 8,275 acres of prairie dog towns. This is similar to the 27% worst case expansion rate used in this analysis. A 90% success rate of poisoning is common (Sullins, M., 1977, 1980). With those calculations in mind the action would require controlling 3,250 acres of prairie dogs for 4 years and finishing up in the fifth year on about 2,855 acres (Appendix 4). This would require poisoning 15,855 acres of prairie dogs with zinc phosphide in the 5 year period. Follow up work with gas cartridges could follow shortly after the initial poisoning on about 325 acres yearly over the 5 year period.

Benefits from the proposed action would begin in the sixth year and continue through the fifteenth year. Even though some benefits do begin in the first 5 years all benefits would be calculated as beginning in the sixth year for analysis purposes.

METHODS

Methods for accomplishing this action consist of:

1. amending or preparing the AMP,
2. completing the damage assessment report,
3. completing the environmental clearances,
4. evaluating the assessment and clearances,
5. controlling prairie dog towns which require action,
6. treating any prairie dog town mechanically or chemically (fertilizer) that would not respond to poisoning alone,
7. implementing the grazing system,
8. monitoring the AMP to reach the objectives of the plan.

ALTERNATIVE B CONTROL AND MANAGEMENT LEVEL I

DESCRIPTION OF MANAGEMENT

Alternative B proposes managing 15-20 prairie dog towns covering 900-1,200 acres on public lands in the Phillips RA (Figure 3 and Table 1). Damage assessment reports, other clearances and permittee or public preference may slightly modify the location and acreage of managed towns, as long as the totals stay within the given range of the alternative. For analysis purposes, 15 towns covering 900 acres are being used in this document. Control by poisoning would take place on the remaining 81 prairie dog towns covering 7,375 acres. Criteria used to select the dog towns for control or management are presented in Table 3. Explanations of how the criteria were applied are given at the bottom of Table 3, under subscripts 4 and 5. The action would take place over a 5 year period. This alternative would affect the 43 allotments that were discussed in Alternative A. The managed prairie dog towns would be included in 15 allotments (Table 3).

This alternative would require controlling 3,100 acres of prairie dog towns in each of the first 4 years and 3,085 acres in the fifth year for a total of 15,485 acres. Follow up work with gas cartridges would be required on 310 acres of prairie dog towns in each of the 5 years or 1,550 acres over the 5 year period. In the long term, sixth through fifteenth year, maintenance would be required on the leave towns. About 240 acres of control would be required yearly to maintain the leave towns at the desired size (Appendix 5). Benefits would be identified in the long term.

METHODS

Methods for accomplishing this action consist of 1-8 of Alternative A plus:

9. completing endangered species clearance on a managed town as periodic control is necessary (this clearance is only good for 12 months, then must be redone),
10. poisoning prairie dogs which need maintenance on a periodic basis.

FIGURE 2. ALLOTMENTS IN PHILLIPS RESOURCE AREA WHERE BLACK-TAILED PRAIRIE DOGS ARE FOUND ON PUBLIC LANDS.

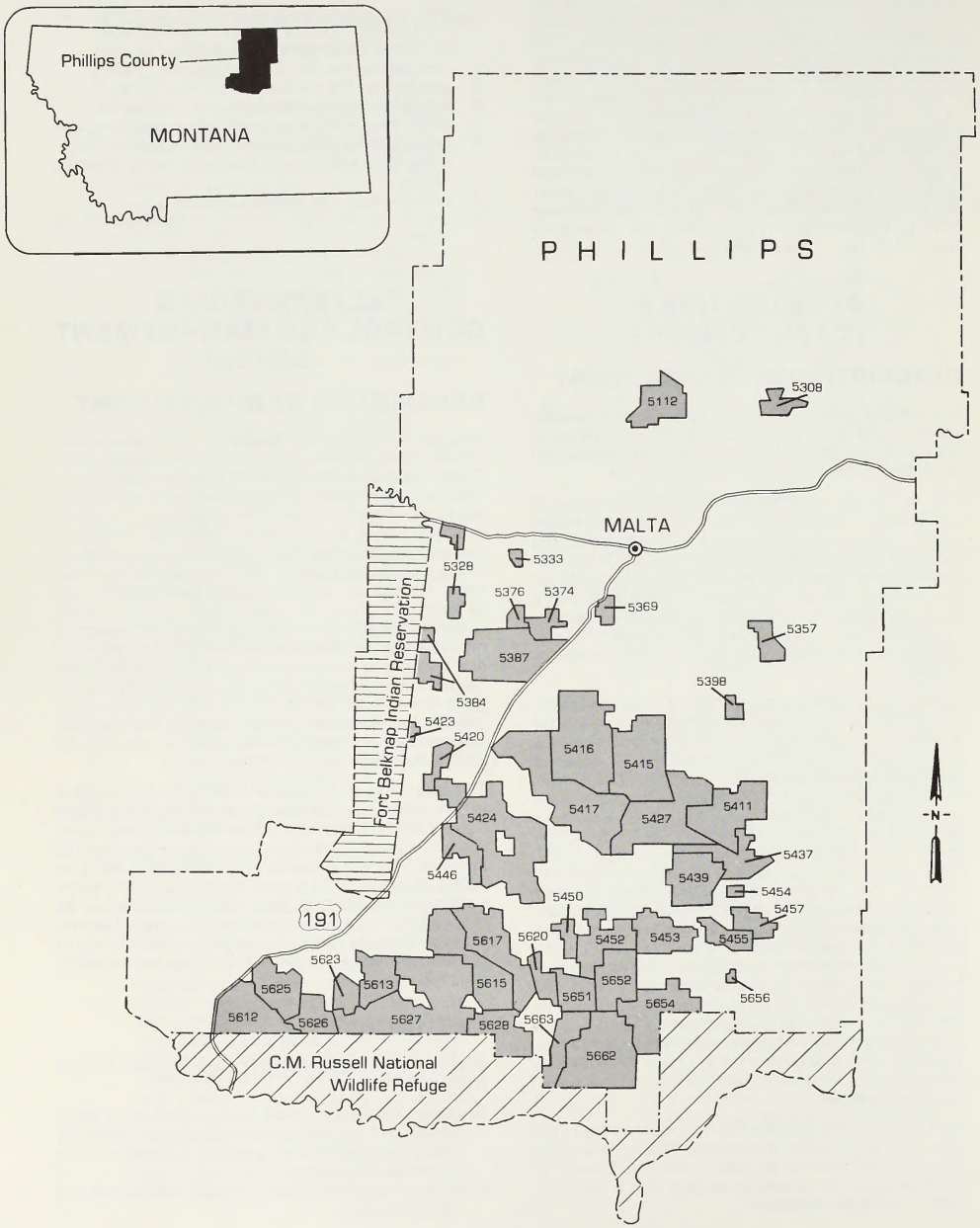


FIGURE 3. BLACK-TAILED PRAIRIE DOG TOWNS WHICH WOULD BE LEFT IN ALTERNATIVE B.

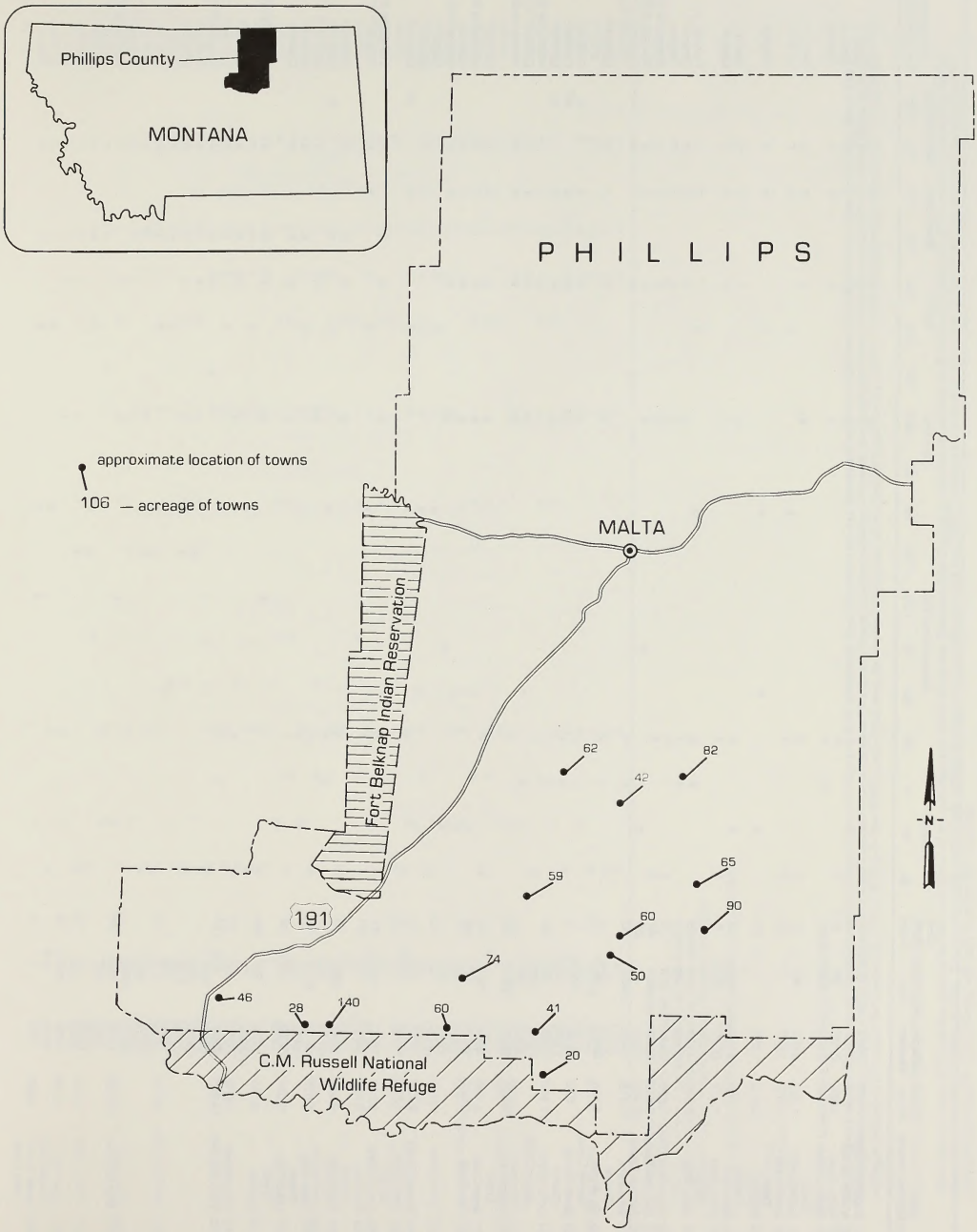


TABLE 3: BLACK-TAILED PRAIRIE DOG TOWNS MANAGED OR CONTROLLED IN ALTERNATIVE B

Application of criteria differentiating control towns from managed towns is explained in subscripts 4 and 5.

Number	Allotment Name	BLM Acres	Town Number[1]	Town Size (Ac.)	0.5% BLM Acres	Criteria: Access[3] G	Access M	Access P	Encroachment (Mi) .25	Encroachment (Mi) .50	Encroachment (Mi) .75	Encroachment (Mi) 1.00	Encroachment (Mi) +1.00	Size (Ac.) 20	Size (Ac.) 20-320	Size (Ac.) 320	Towns New	Towns Old	Near CMR Yes	Near CMR No	Safe Shooting Yes	Safe Shooting No	Management Recommendation
5112	Bughouse Coulee	1,836	1420	177*	9	X			X						X			X		X	X		Control[4]
5308	McNeil Slough	215	1722	149*	1		X		X						X			X		X	X		Control
5328	Rocky Point	1,809	0999	83	9	X			X						X			X		X	X		Control
5333	South Dodson Canal	40[2]	3109	162*	2			X	X						X			X		X	X		Control
5357	Rock Corral	1,528	3392	61	8	X			X						X			X		X	X		Control
5369	South Alkali Creek	2,420	1099	1	12	X			X					X			X			X	X		Control
5374	Half-way Coulee	2,210	1398	7	11		X			X				X			X			X	X		Control
5376	Nice Pond	756	2198	192*	4		X		X						X			X		X	X		Control
5384	North Wild Horse	1,277	2087	150*	6	X			X						X			X		X	X		Control
5387	West Alkali	9,614	1187	6	48			X	X					X			X			X	X		Control
			1088	49				X	X						X			X		X	X		Control
5398	North DHS Creek	569	2581	203	3	X			X						X			X		X	X		Control
5415	Overflow Coulee	8,446	0860	46*	42	X			X						X			X		X	X		Manage at 42 acres[5]
5416	Sanford Coulee	12,448	3379	91	62		X				X				X			X		X	X		Manage at 62 acres
5417	Whiterock Coulee	17,916	1669	340*	90			X	X							X		X		X	X		Control
5420	Big Warm Spring Creek	1,129	0669	90*	6			X	X						X			X		X	X		Control
5423	South Spring Coulee	522	1476	107*	3			X	X						X			X		X		X	Control
			1376	25*				X	X						X			X		X		X	Control
5424	Little Warm Spring Creek	11,819	1268	35	59			X	X						X			X		X		X	Control
			2558	170		X			X						X			X		X	X		Manage at 59 acres
			3567	131				X		X					X			X		X	X		Control
5427	North Flat Creek	16,431	3371	105*	82		X		X						X			X		X	X		Manage at 82 acres
5437	Sage Creek	3,125	1852	72*	16	X			X						X			X		X	X		Control
5439	Flat Creek	13,042	2151	90	65		X			X					X			X		X	X		Manage at 65 acres
			1751	27			X			X					X			X		X	X		Control
			1451	34			X				X				X			X		X	X		Control
			0351	3		X								X			X					Control
5446	Parrot Coulee	2,737	1257	5	14		X			X				X			X			X	X		Control
5450	First Creek School	1,120	2849	15*	6	X			X					X			X			X		X	Control
5452	Long Coulee	8,221	1640	160*	41	X			X						X			X	X		X		Manage at 41 acres
5453	Stratton Coulee	8,100	1240	10	41	X			X					X			X			X	X		Control
5454	Dog Creek	2,025	1241	285	10	X			X						X			X	X		X		Control
			0141	10				X	X					X			X		X			X	Control
5455	Lower Dog Creek	3,075	1441a	81*	15	X			X						X			X		X			Control
			1441b	11			X		X					X			X		X		X		Control
5457	Upper Dog Creek	3,593	0842	99*	18	X			X						X			X	X		X		Control
5612	Cygnan	9,133	1834	53	46	X						X			X			X	X		X		Manage at 46 acres
			2044	1		X					X			X			X		X			Control
5613	Camp Creek	3,010	0836	30	15	X			X						X			X	X		X		Control
5615	West Dry Fork	14,854	2947	2*	74			X	X					X			X		X		X		Control
			0137	351		X					X					X		X	X		X		Manage at 74 acres
			0838	167		X							X		X			X	X		X		Control
			0738	178		X							X		X			X	X		X		Control
			1938	4			X			X				X			X		X		X		Control
			0538	1		X							X	X			X		X		X		Control
			0538	21		X							X		X			X	X		X		Control
			3647	64*		X			X						X			X	X		X		Control
5617	East Dry Fork	18,032	1141	196	90			X				X			X			X		X		X	Manage at 90 acres
			1848	637				X	X							X		X	X		X		Control
			2347	7		X							X	X			X		X		X		Control
			3048	25		X							X		X			X	X		X		Control
5620	Upper Four-chette Creek	3,269	1238	157*	16		X		X						X			X	X		X		Control
			3548	1*		X			X					X			X		X		X		Control
5623	Upper Seven Mile Creek	3,809	1335	5	19		X					X		X			X		X		X		Control

5625	Lavelle Creek	9,691	0934	14	48	X			X					X			X		X			X	Control
			1334	2		X					X			X			X		X		X		Control
			1835	133			X		X						X			X	X			X	Control
5626	Rock Creek	5,510	2235	18	28	X			X					X			X		X			X	Control
			3335	173			X						X		X			X	X			X	Manage at 28 acres
			1535	122✲		X			X						X			X	X			X	Control
5627	Nichols Coulee	28,078	3535	215	140	X			X						X			X	X			X	Manage at 140 acres
			3136	106		X				X					X			X	X			X	Control
			3236	2		X				X				X			X		X			X	Control
			2836	1			X						X	X			X		X			X	Control
			2237	56✲		X			X						X			X	X			X	Control
			1737	76		X			X						X			X	X			X	Control
			0637	51		X				X					X			X	X			X	Control
			0437	41		X			X						X			X	X			X	Control
			1137	178		X			X						X			X	X			X	Control
			2636	1			X				X			X			X		X			X	Control
			3137	12				X			X			X			X		X			X	Control
			0247	232			X		X						X			X	X			X	Control
5628	Beauchamp Creek	11,955	3138	49	60			X		X					X			X	X			X	Control
			3438	54				X	X						X			X	X			X	Control
			1348	3		X			X					X			X			X		X	Control
			0228a	3				X			X			X			X		X			X	Control
			3637	226✲			X		X						X			X	X			X	Manage at 60 acres
			1837	2				X	X					X			X		X			X	Control
5651	North Fourchette Creek	5,200	0539	16	26	X			X					X			X		X			X	Control
			1039	110✲			X		X						X			X	X			X	Control
			1739	61				X	X						X			X	X			X	Control
5652	Third Creek	10,001	0730	75	50		X							X	X			X	X			X	Control
			2940	218			X		X						X			X	X			X	Manage at 50 acres
5654	Telegraph Creek	11,412	2230	19	57		X		X					X				X	X			X	Control
			2330	6				X						X	X		X		X			X	Control
			2430	1				X	X					X			X		X			X	Control
5656	Upper Lonetree	554	0732	3	3		X		X					X			X		X			X	Control
5662	Fourchette Creek	19,049	2538	113	95		X		X						X			X	X			X	Control
			3139	41✲			X		X						X			X	X			X	Manage at 41 acres
			2329	17				X						X	X		X		X			X	Control
			3239	10			X		X						X		X		X			X	Control
			3439	32✲		X			X						X			X	X			X	Control
			0128	223			X		X						X			X	X			X	Control
5663	First Coulee	3,771	0829	290✲	19	X			X						X			X	X			X	Control
			2029	53✲		X			X						X			X	X			X	Control
			2929	34		X			X						X			X	X			X	Manage at 20 acres

[1] The number containing the legal description:
the first two numbers are the section,
the third number is the last number of the township,
the fourth number is the last number of the range.
Example: T. 25 N., R. 30 E., Section 16 would be #1650.

[2] Does not include Bureau of Reclamation land within the allotment.

[3] Access
G — Good
M — Medium
P — Poor

[4] Selection of a control town in Bughouse Coulee:

Alternative B uses 0.5% as the control for allowed acres of prairie dogs per BLM allotment. The Bughouse Coulee Allotment contains 1,836 acres of BLM lands. This would allow managing 9 acres of prairie dogs (.005 x 1,836). Since this acreage (9 acres) is less than the 20 acre minimum recommended by the panel, the Bughouse Coulee town was selected for control. Other factors aiding in selecting this town for control were that it is not near CMR, a potential area for the reintroduction of the black-footed ferret, and its closeness to private land where encroachment could occur.

[5] Selection of a manage town in Overflow Coulee:

Alternative B uses 0.5% as the control for allowed acres of prairie dogs per BLM allotment. The Overflow Coulee Allotmant contains 8,446 acres of BLM lands. This would allow managing 42 acres of prairie dogs (.005 x 8,446). This acreage (42 acres) falls within the panel's recommanded size range for managad prairie dog towns. Other factors aiding in selecting this town for management were its good access and safe location for shooting.

✲The town has some intermingled State or private land within its boundary.

ALTERNATIVE C
CONTROL AND MANAGEMENT LEVEL II

DESCRIPTION OF MANAGEMENT

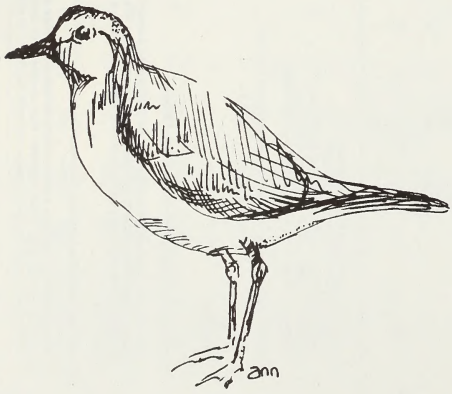
Alternative C proposes to manage 30-35 prairie dog towns covering 2,500-2,900 acres on public lands in the Phillips RA (Figure 4). Damage assessment reports, other clearances and permittee or public preference may slightly modify the location and acreage of managed towns as long as the totals stay within the given range of the alternative. For analysis purposes, 33 towns covering 2,640 acres are being used in this document. Control by poisoning would take place on the remaining 63 prairie dog towns covering 5,630 acres. Criteria used to select the dog towns for control and/or management are presented in Table 4. The action would take place over a 5 year period.

The proposed action would affect the 43 allotments that were discussed in Alternative A. The prairie dog towns left for management would be included in 27 allotments (Table 4).

This alternative would require controlling 2,900 acres of prairie dogs in each of the first 4 years and 2,850 acres in the fifth year for a total of 14,450 acres. Follow up work with gas cartridges would be required on 290 acres of prairie dog towns in each of the 5 years or 1,450 acres over the 5 year period. In the long term, sixth through fifteenth year, maintenance would be required on the leave towns. About 700 acres of control would be required yearly to maintain the leave towns at the desired size (Appendix 6). Benefits would be identified in the long term.

METHODS

The same as Alternative B.



ALTERNATIVE D
NO CONTROL OR MANAGEMENT

DESCRIPTION OF MANAGEMENT

Alternative D proposes no control of prairie dogs on public lands in Phillips RA.

Taking no action, as described in this alternative, would significantly impact the 43 allotments discussed in Alternative A, plus other allotments where prairie dog expansion would be likely.

The eight AMPs scheduled for completion would be finished but without consideration for prairie dogs. No additional AMPs would be necessary to complete this proposal. No amendments to the existing AMPs would be needed.

METHOD

1. Controlling prairie dogs through recreational shooting.

The Phillips RA now contains 8,275 acres of prairie dog towns on public lands. Again, using the *worst* case expansion rate of 27% that existed in South Dakota, the acreage of prairie dogs in the area could possibly expand to 298,380 acres by the end of the long term (Appendix 7).

It is estimated from field observations that the habitat available for expansion far exceeds the above projection. However, the estimate does not take into consideration plague or other possible natural population controls which may occur before the population reaches the projection.

FIGURE 4. BLACK-TAILED PRAIRIE DOG TOWNS WHICH WOULD BE LEFT IN ALTERNATIVE C.

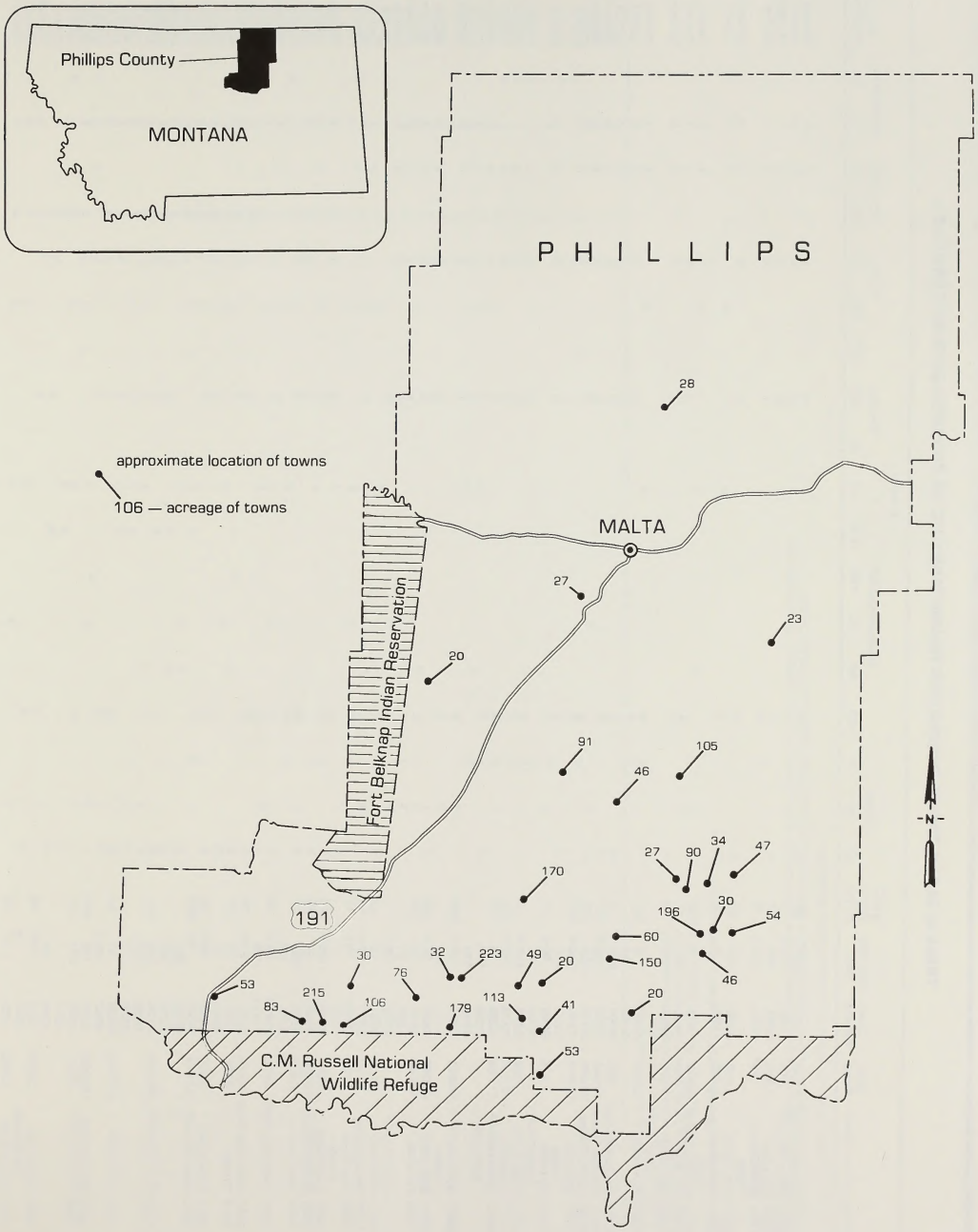


TABLE 4: BLACK-TAILED PRAIRIE DOG TOWNS MANAGED OR CONTROLLED IN ALTERNATIVE C

Number	Allotment Name	BLM Acres	Town Number[1]	Town Size (Ac.)	0.5% BLM Acres	Criteria: Access[3] G	M	P	Encroachment (Mi) .25	.50	.75	1.00	+1.00	Size (Ac.) 20	20-320	320	Towns New	Old	Near CMR Yes	No	Safe Shooting Yes	No	Management Recommendation
5112	Bughouse Coulee	1,636	1420	177*	28	X			X						X			X		X	X		Manage at 28 acres[4]
5308	McNeil Slough	215	1722	149*	3		X		X						X			X		X	X		Control
5328	Rocky Point	1,809	0998	83	27	X			X						X			X		X	X		Manage at 27 acres
5333	South Dodson Canal	40[2]	3109	162*	.6			X	X						X			X		X	X		Control
5357	Rock Corral	1,528	3392	61	23	X			X						X			X		X	X		Manage at 23 acres
5369	South Alkali Creek	2,420	1099	1	36	X			X				X				X			X	X		Control
5374	Half-way Coulee	2,210	1398	7	33		X			X			X				X			X	X		Control
5376	Nice Pond	756	2198	192*	11		X		X						X			X		X	X		Control
5384	North Wild Horse	1,277	2087	150*	19	X			X						X			X		X	X		Manage at 20 acres
5387	West Alkali	9,614	1187	6	144			X	X				X				X			X	X		Control
			1088	49				X	X						X			X		X	X		Control
5398	North DHS Creek	569	2581	203	9	X			X						X			X		X	X		Control
5415	Overflow Coulee	8,446	0860	46*	127	X			X						X			X		X	X		Manage at 46 acres
5416	Sanford Coulee	12,448	3379	91	187		X				X				X			X		X	X		Manage at 91 acres
5417	Whiterock Coulee	17,916	1669	340*	269			X	X							X		X		X	X		Control
5420	Big Warm Spring Creek	1,129	0669	90*	17			X	X						X			X		X	X		Control
5423	South Spring Coulee	522	1476	107*	8			X	X						X			X		X		X	Control
			1376	25*				X	X						X			X		X		X	Control
5424	Little Warm Spring Creek	11,819	1268	35	177			X	X						X			X		X		X	Control
			2558	170		X			X						X			X		X	X		Manage at 170 acres
			3567	131				X		X					X			X		X	X		Control
5427	North Flat Creek	16,431	3371	105*	246		X		X						X			X		X	X		Manage at 105 acres
5437	Sage Creek	3,125	1852	72*	47	X			X						X			X		X	X		Manage at 47 acres
5439	Flat Creek	13,042	2151	90	196		X			X					X			X		X	X		Manage at 90 acres
			1751	27			X			X					X			X		X	X		Manage at 27 acres
			1451	34			X				X				X			X		X	X		Manage at 34 acres
			0351	3		X				X							X					Control
5446	Parrot Coulee	2,737	1257	5	41		X			X					X			X		X	X		Control
5450	First Creek School	1,120	2849	15*	17	X			X						X			X		X		X	Control
5452	Long Coulee	8,221	1640	160*	123	X			X						X			X	X		X		Manage at 123 acres
5453	Stratton Coulee	8,100	1240	10	122	X			X						X			X		X	X		Control
5454	Dog Creek	2,025	1241	285	30	X			X						X			X	X		X		Manage at 30 acres
			0141	10				X	X						X			X		X		X	Control
5455	Lower Dog Creek	3,075	1441a	81*	46	X			X						X			X		X	X		Manage at 46 acres
			1441b	11			X		X						X			X		X	X		Control
5457	Upper Dog Creek	3,593	0842	99*	54	X			X						X			X		X	X		Manage at 54 acres
5612	Cyprian	9,133	1834	53	137	X						X			X			X		X	X		Manage at 53 acres
			2044	1		X					X									X	X		Control
5613	Camp Creek	3,010	0836	30	45	X			X						X			X		X	X		Manage at 30 acres
5615	West Dry Fork	14,854	2947	2*	223			X	X												X		Control
			0137	351		X					X					X		X		X	X		Manage at 223 acres
			0838	167		X							X		X			X		X	X		Control
			0738	178		X							X		X			X		X	X		Control
			1938	4			X			X				X						X	X		Control
			0538	1		X							X	X						X	X		Control
			0538	21		X							X		X			X		X	X		Control
			3647	64*		X			X						X			X		X	X		Control
5617	East Dry Fork	18,032	1141	196	270		X					X			X			X		X	X		Manage at 196 acres
			1848	637			X		X								X	X		X	X		Control
			2347	7		X							X	X				X		X	X		Control
			3048	25		X							X		X			X		X	X		Control
5620	Upper Four-chette Creek	3,269	1238	157*	49		X		X						X			X		X	X		Manage at 49 acres
			3548	1*		X			X				X					X		X	X		Control
5623	Upper Seven Mile Creek	3,809	1335	5	57		X				X		X					X		X	X		Control

5625	Lavelle Creek	9,691	0934	14	145	X			X					X			X		X		X	Control
			1334	2		X					X			X			X		X	X	Control
			1835	133			X		X						X			X	X		Control
5626	Rock Creek	5,510	2235	18	83	X			X					X			X		X		Control
			3335	173			X						X		X		X	X	X		Manage at 83 acres
			1535	122✲		X			X						X		X	X	X		Control
5627	Nichols Coulee	28,078	3535	215	421	X			X						X		X	X	X		Manage at 215 acres
			3136	106		X				X					X		X	X	X		Manage at 106 acres
			3236	2		X				X				X			X	X	X		Control
			2836	1			X						X	X			X	X	X		Control
			2237	56✲		X			X						X		X	X	X		Manage at 32 acres
			1737	76		X			X						X		X	X	X		Manage at 76 acres
			0637	51		X				X					X		X	X	X		Control
			0437	41		X			X						X		X	X	X		Control
			1137	178		X			X						X		X	X	X		Control
			2636	1			X				X			X			X	X	X		Control
			3137	12				X			X			X			X	X	X		Control
			0247	232			X		X						X			X	X		Control
5628	Beauchamp Creek	11,955	3138	49	179			X		X					X			X	X		Control
			3438	54				X	X						X			X	X		Control
			1348	3		X			X					X			X		X		Control
			0228a	3				X			X			X			X		X		Control
			3637	226✲			X		X						X			X	X		Manage at 179 acres
5651	North Four-chette Creek	5,200	0539	16	78	X			X					X			X		X		Manage at 20 acres
			1039	110✲			X		X						X			X	X	X	Control
			1739	61				X	X						X			X	X		Control
			1837	2				X	X					X			X		X		Control
5652	Third Creek	10,001	0730	75	150		X						X		X			X	X		Control
			2940	218			X		X						X			X	X		Manage at 150 acres
5654	Telegraph Creek	11,412	2230	19	171		X		X					X				X	X		Manage at 20 acres
			2330	6				X					X	X			X		X		Control
			2430	1				X	X					X			X		X		Control
5656	Upper Lonetree	554	0732	3	8		X		X					X			X		X		Control
5662	Fourchette Creek	19,049	2538	113	286		X		X						X			X	X		Manage at 113 acres
			3139	41✲			X		X						X			X	X		Manage at 41 acres
			2329	17				X						X	X		X		X		Control
			3239	10			X		X						X		X		X		Control
			3439	32✲		X			X						X			X		X	Control
			0128	223			X		X						X			X		X	Control
5663	First Coulee	3,771	0829	290✲	57	X			X						X			X		X	Control
			2029	53✲		X			X						X			X	X		Control
			2929	34		X			X						X			X	X		Manage at 57 acres

[1]The number containing the legal description:
the first two numbers are the section,
the third number is the last number of the township,
the fourth number is the last number of the range.
Example: T. 25 N., R. 30 E., Section 16 would be #1650.

[2]Does not include Bureau of Reclamation land within the allotment.

[3]Access
G — Good
M — Medium
P — Poor

[4]Alternative C uses 1.5% as the control for allowed acres of prairie dogs per BLM allotment. This is the greatest difference between Alternative B and Alternative C (0.5% vs. 1.5%). Application of the criteria is explained under subscripts 4 and 5 in Table 3.

✲ The town has some intermingled State or private land within its boundary.

CHAPTER 3
THE AFFECTED ENVIRONMENT

Environmental components not impacted by implementation of any of the alternatives include climate, air quality, topography, geology, wilderness and prehistoric and historic features. Descriptions of these components are necessary for the reader to better understand the situation and environment but aren't carried forward to Chapter 4, Environmental Consequences.

CLIMATE

The climate in the Phillips Resource Area (Phillips RA) is typically continental. Wide variations in the occurrence, duration, intensity and distribution of precipitation are common. Precipitation averages from 11-13 inches annually. Most rain falls during the growing season, April through September. Temperatures vary from 100 degrees F. in the summer to less than 40 degrees F. in the winter. Average July temperatures range from 65-72 degrees F. and the average January temperature ranges from 5-24 degrees F., with the warmer January averages found in the western parts of the Phillips RA. The last spring frost (32 degrees F.) occurs from May 13-May 31 and the first fall frost (32 degrees F.) occurs from September 8-September 25. The area is also susceptible to strong, gusty winds.

AIR QUALITY

Air quality of the Phillips RA is Class II which is considered good by Environmental Protection Agency (EPA) standards. Automobile emissions are low due to the low population density. Noxious gas and dust concentrations are similarly low due to the absence of heavy manufacturing. Significant particulate concentrations (mostly dust) do occur during prolonged periods of strong winds. Most of this dust comes from dryland farming and mining activity. Range and forest fires occasionally result in periods of high particulate concentrations in the resource area.

TOPOGRAPHY

Topography varies from flat upland plains, to rolling hills, to badlands and rough breaks, to the Little Rocky Mountains in the southwestern part of the Phillips RA. The Milk River flows west to east and divides the resource area almost in half, while the Missouri River forms the southern boundary of the Phillips RA. In addition, the resource area has a number of broad flat alluvial floodplains and terraces with deep cut gullies fingering back from main drainages. Elevations vary from 2,000-6,000 feet, with the majority around 3,000 feet.

GEOLOGY

Public lands in the Phillips RA are composed of seven exposed geologic formations on the plains and river breaks areas. These formations include: Recent Alluvium, Flaxville, Hell Creek, Fox Hill, Bearpaw Shale, Judith River, and Claggett. In addition, one structural upthrust from tertiary igneous activity, the Little Rocky Mountains, is located in the resource area and has numerous exposed geologic formations.

WILDERNESS

There are three wilderness study areas (WSAs) in the Phillips RA; Cow Creek, Antelope Creek and Burnt Lodge. At present, no prairie dog towns are known within a WSA. However, should management of prairie dog towns found in a WSA be necessary, the management program would follow the guidelines for interim WSA management. The guidelines state that animal damage control measures are permitted, so long as the continued presence of the target species is not jeopardized. This means dog towns in a WSA can be managed but not controlled.

Should a WSA be designated wilderness by Congress, management programs would not be permitted, except where over population poses a serious threat to other wilderness values or resources and property outside the boundaries of the wilderness area. In such instances, management projects would be approved on a case by case basis.

PREHISTORIC AND HISTORIC FEATURES

The impacts of prairie dog control and/or management through poisoning will have no effect on cultural resources as the methods of control discussed in this document are not surface disturbing activities.

SOILS AND WATERSHED

The soils of the Phillips RA are derived mainly from glacial till, sedimentary bedrock and alluvium from mixed rock sources. Because of this, the resource area has complex and diverse soil patterns, varying greatly in character and productivity.

At the present time, the public lands in the Phillips RA are covered by a third order soil survey. The physical properties of the soil series can be found in the *Prairie Potholes Grazing EIS*. The EIS groups these soils into 19 geomorphic soil subgroups for descriptive purposes.

An evaluation of soils and landforms was developed from Phillips RA soil maps and the Montana General Soils Map (USDA Soil Conservation Service and Montana Agriculture Experiment Station; October 1978). They show that approximately 65% of resource area is glacial till, 30% sedimentary upland and 5% alluvium and other sources (Table 5 & Figure 5). From evaluating the soil mapping units, it's estimated that 35% of the Phillips RA has soil characteristics, either excess slope or soil wetness, that would limit use by prairie dogs.

TABLE 5: DISTRIBUTION OF BLACK-TAILED PRAIRIE DOG TOWNS AS COMPARED TO LANDFORMS

Landform	% of Phillips Resource Area	% of Public Land Dog Towns	% of All Dog Towns
Glacial Till	65	67.7	68.9
Sedimentary Upland	30	27.8	27.2
Alluvium & Others	5	4.5	3.9

The occurrence of prairie dog towns on each soil subgroup within the resource area is listed in Table 6. This shows the distribution of prairie dog towns is very similar to the distribution of soil subgroups and landforms (Table 5).

The soil subgroups that prairie dog towns occur on, vary greatly in their response to range management techniques. Appendix 8 lists characteristics of these 9 soil subgroups. Soil subgroups 3, 4 and 10, on which approximately 26% of the prairie dog towns occur, will readily respond to grazing management, due to soil characteristics, but are not suited to mechanical treatments. The remaining soil subgroups, on which approximately 74% of the prairie dog towns occur, respond slowly, to very slowly to grazing management, due to soil and vegetation limitations, but are suited to mechanical treatments. Mechanical treatments would increase production two to four times on these soils by changing vegetation composition, improving infiltration, reducing runoff and catching more snow (*Prairie Potholes Grazing EIS*, p. 26).

The soil subgroups that occur on glacial till (Appendix 8), have slight to moderate susceptibility to water erosion and moderate wind erosion susceptibility when the soil is bare of vegetation. The soil subgroups that occur on sedimentary uplands have moderate to high water erosion susceptibility erosion and severe wind erosion susceptibility. The soil subgroups that occur on alluvium have slight to high susceptibility to water erosion and severe susceptibility to wind erosion (*Prairie Potholes Grazing EIS*, Appendix 3.1).

TABLE 6: OCCURRENCE OF BLACK-TAILED PRAIRIE DOG TOWNS BY SOIL SUBGROUPS IN PHILLIPS RESOURCE AREA

Soil Subgroup	Towns on Public Land (Percent)	All Towns (Percent)
1	18.6	23.5
2	47.5	43.7
3	14.1	12.5
4	10.3	9.7
5	1.3	0.8
9	1.0	0.6
10	2.1	4.2
11	0.6	1.1
13	4.5	3.9

VEGETATION

The major vegetation type on public lands in the Phillips RA is grassland. Other vegetation types commonly found, but of lesser significance, are the sagebrush and greasewood types.

Vegetation typical to the Northern Great Plains is found in the grassland type. Major grasses are needleandthread grass, blue grama, western wheatgrass, Sandberg bluegrass and green needlegrass. Grasses of lesser importance are prairie junegrass, plains muhly, little bluestem, inland saltgrass and crested wheatgrass. Sedges and clubmoss are very common. Common forbs include Hood's phlox, scarlet globemallow, wooly plantian, silverleaf scurfpea and prairie coneflower. Shrubs present in the grassland type include big sagebrush, silver sagebrush, fringed sagewort, wild rose and snowberry.

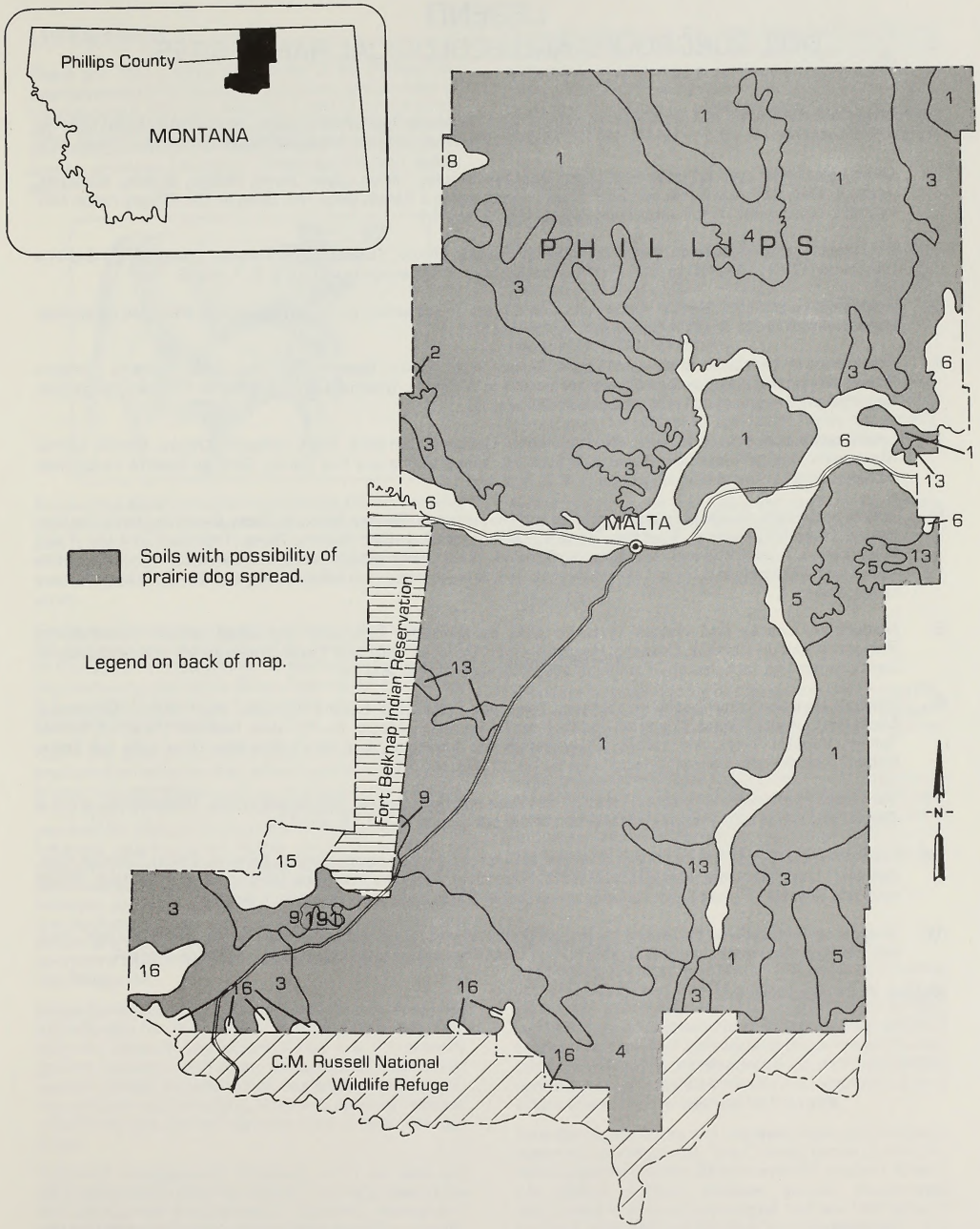
Ecological range conditions in the Phillips RA vary from poor to excellent. Range surveys conducted during the *Missouri Breaks* and *Prairie Potholes Grazing EISs* indicated about 62% of the public lands south of the Milk River (general area of existing prairie dog towns) are in good to excellent range condition. Prairie dog towns are primarily in poor to fair range condition.

Deteriorated range sites (i.e. prairie dog towns) have a predominance of increaser and invader type plant species. Vegetation commonly found on these sites include blue grama, fringed sagewort, broom snakeweed, Hood's phlox, plains pricklypear, scarlet globemallow and clubmoss.

These fair to poor range condition sites also become susceptible to invasion of undesirable plant species such as: Russian thistle, Canadian thistle and kochia. Although not a problem at this time, leafy spurge is well established in areas adjacent to the resource area and certainly has the potential to invade deteriorated and disturbed sites in the area.

No threatened, endangered or sensitive plant species are known to occur in the Phillips RA.

FIGURE 5. A GENERALIZED SOILS MAP OF PHILLIPS RESOURCE AREA.



LEGEND
SOIL SUBGROUPS AND ECOLOGICAL RANGE SITES

Geomorphic soil subgroups, soil descriptions, dominant soil series ecological range sites, and other included soil subgroups. Soil subgroups 7, 10, 11, 12, 14, 16, 17, 18, and 19 are not shown to the small size of each area of these soils.

1. Loamy glacial till soils on uplands. Series: Bearpaw, Dooley, Hillion, Joplin, Kevin, Phillips, Scobey, Sunburst, Telstad, Vida, Williams Zahill, and Zahl. These series are in a Sandy, Silty, Thin Silty, or Thin Clayey range site. Includes small areas of soil subgroups 2, 3, 4, 6, 7, 9, and 11.

2. Dominantly claypan soils on glacial till uplands. Series: Elloam, Tealette, and Thoeny. These series are in a Claypan or Dense Clay range site. Includes small areas of soil subgroups 1, 3, 4, 6, 7, and 9.

3. Acid shale upland soils. Series: Dilts, Julin, and Teigen. These series are in a Clayey or Coarse Clay range site. Includes small areas of soil subgroups 4, 5, 12, and 15.

4. Calcareous or bentonitic shale upland soils. Series: Abor, Barkof, Bascovy, Dimyaw, Lisam, Neldore, Norbert, Thebo, Weingart, and Yawdim. These series are in a Clayey, Shallow Clay, Shallow, or Claypan range site. Includes small areas of soil subgroups 3, 6, 10, and 13.

5. Loamy sedimentary upland soils. Series: Cabba, Cabbart, Cambert, Dast, Delpoint, Doney, Ernem, Lonna, Marmarth, Reeder, Rentsac, Riedel, and Twilight. These series are in a Sandy, Silty, or Shallow range site. Includes small areas of soil subgroups 2, 4, 6, 8, 9, and 11.

6. Loamy and clayey alluvial soils on floodplains and low terraces. Series: Bowdoin, Gesa, Glendive, Hanly, Harlem, Havre, Havrelon, Kiwanis, Korchea, Korent, Lallie, Lardell, Lohler, Nesda, Rivra, Trembels and the Typic Fluvaquents, Typic Ustifluvents, Aquic Ustifluvents, Fluvaquentic Haploborolls, and Ustic Torrifluvents. These soil series are dominantly in an Overflow range site. Small areas are in a Saline Lowland, Sandy, Silty, or Clayey range site.

8. Moderately coarse and coarse textured soils on terraces, fans, and footslopes. Series: Assinniboine, Blanchard, Busby, Chinook, Cozberg, Hawksell, Lihen, Parshall, Tally, and Yetull. These series are in a Sands or Sandy range site. Includes small areas of soil subgroups 5, 6, 9, and 14.

9. Medium textured alluvial soils on terraces, fans, and footslopes. Series: Attewan, Benz, Bitton, Brockway, Evanston, Farland, Farnuf, Floweree, Judith, Kremlin, Lambeth, Macar, Martinsdale, Redvale, Shawmut, Straw, Turner, Vanstel, Work, and Yamac. These series are dominantly in a Silty range site. Benz soils are Saline Upland. Includes small areas of subgroups 6, 10, 11, 12, and 14.

13. Very slowly permeable clay alluvial soils on terraces and fans. Series: Vaeda and Vanda. These series are in a Dense Clay range site. Includes small areas of soil subgroups 6, 10, 11, and 12.

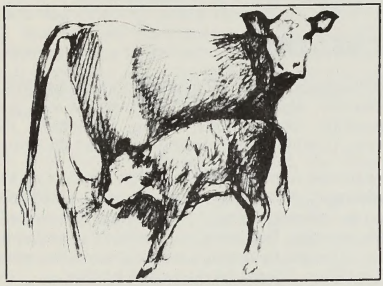
15. Loamy and clayey soils in mountainous areas with forest canopy cover. Series: Arcette, Belain, Cowood, Elve, Gambler, Lolo, Macmeal, Repp, Sicklesteets, Silverchief, Trapper, Warneke, Whitecow, and Whitore. These soils are Grazable Forest Land. Includes small areas of soil subgroup 18 and rock outcrop.

16. Shallow to deep soils on dissected shale upland slopes with forest canopy cover. Series: Boscovy Dilts, Julin, and Neldore. These series are Grazable Forest Land. This subgroup is included in subgroups 3 and 4.

Source: Prairie Potholes EIS.

LIVESTOCK

There are 360 grazing allotments in the Phillips RA. Approximately 270 livestock operators are licensed to harvest about 183,400 Federal AUMs of forage annually. These figures change frequently from various administrative alterations (i.e. ranch sales and transfer, preference changes, allotment consolidations and splits, etc.).



At this time 43 allotments in the Phillips RA have prairie dog towns on public lands, affecting 36 livestock operators (Table 1 & Figure 2). There are 10 additional grazing allotments that have prairie dog towns located on private or state lands affecting 5 additional livestock operators.

Cattle are the most prevalent livestock in the Phillips RA. However, some sheep and horses are also licensed on these public lands. Of the 43 allotments with prairie dog towns on public lands, 39 are licensed for cattle only, 2 for cattle and horses, 1 for cattle and sheep, and 1 allotment for sheep only.

There are several different livestock production programs in the resource area. Most ranchers are involved in cow/calf operations, selling calf crops in the fall. Normally about 15-25% of the previous year's calf crop is retained for replacements in the breeding herd. Often, livestock operators will retain calves in addition to replacement stock or purchase additional calves and sell these as yearlings the following year. This gives the livestock operator marketing flexibility. Most ranchers are involved in cross breeding programs. Hereford and Angus are the dominant cattle breeds but Simmental, shorthorn, Maine Anjou and Charlois are also common in the Phillips RA.

Grazing management systems and seasons-of-use vary considerably in the resource area. Rest rotation, deferred rotation and seasonal use are the primary grazing systems with many variations of each basic system utilized. Variations include allotment level stocking, pasture level stocking, different pasture rotation sequences and various pasture turn in and turn out dates.

Intensive management practices, such as rest and deferred rotation grazing systems, normally have a May through October grazing season. Seasonal use systems are grazed periodically during various periods or combinations of periods of spring, summer, fall and winter use.

Currently, there are 22 allotments with prairie dog towns on public lands that are under intensive grazing management systems (i.e. rest or deferred rotation). An additional 21 allotments with prairie dog towns on public lands are scheduled for intensive grazing management in the future.

WILDLIFE

Big Game

There are five big game animal species in the Phillips RA. They are mule deer, pronghorn antelope, white-tailed deer, elk and Rocky Mountain bighorn sheep. The list of scientific names is given in the appendix. Mule deer and antelope habitat could be affected by the alternatives considered in this document.

Mule deer are widely distributed over the resource area. They inhabit the breaks along the Missouri and Milk Rivers and the timber of the Little Rocky Mountains. They are also found in the prairie habitat associated with big and silver sagebrush (Dusek, 1971).

Pronghorn antelope are found throughout the Phillips RA in all vegetation types during the summer. Big sagebrush and silver sagebrush communities are important to antelope in the winter. Winter ranges scattered throughout the resource area contain shrubs over 12 inches tall.

Game Birds

There are six upland game bird species in the Phillips RA. They are the sage grouse, sharp-tailed grouse, Hungarian partridge, ring-necked pheasants, Merriam's turkey and blue grouse.

Sage grouse are closely associated to the sagebrush areas due to their reliance on that shrub for food and cover. However, they are found near hay meadows in the spring and fall seeking green forage, especially forbs. It's the only upland game bird that could be impacted by any of the alternatives.

Waterfowl

The Phillips RA is located within the larger continental potholes region, the most important waterfowl producing area in North America. Water is often the limiting factor in duck production. Natural potholes and artificial stockponds provide important breeding and nesting habitat for waterfowl in the resource area, although nesting and brood cover around stockponds is frequently lacking where there is extensive use by livestock.

Four geese, 23 ducks and one swan species have been observed in Phillips RA. The Canada goose is the only nesting goose species, while the pintail, mallard, American wigeon, northern shoveler, gadwall, blue-winged teal, lesser scaup, green-winged teal and canvasback produce over 96% of the duck broods observed in the resource area (BLM Wildlife Studies, 1979-1981).

Nongame Animals

The Phillips RA supports a wide variety of nongame birds, mammals, reptiles, amphibians and invertebrates. The birdlife is most readily apparent with 202 of 241 species classified as nongame. Mammals, reptiles and amphibians are less diverse than birds and many species are rarely seen.

Prairie dog towns provide important habitat for at least 30 species of wildlife (Koford, 1957). The mountain plover, burrowing owl, golden eagle and ferruginous hawk are species of concern found on prairie dog towns in the resource area (Montana Department of Fish, Wildlife and Parks).

Fisheries

Beaver Creek (a tributary of the Milk River) and 17 of 22 reservoirs in Phillips RA, which either contain fish populations or have a documented potential for fish introductions, occur in the vicinity of existing prairie dog towns. Beaver Creek supports a sport fishery for walleye and northern pike. Rainbow trout, largemouth bass, black crappie and yellow perch are stocked in those reservoirs offering suitable water quality and habitat.

Endangered and Threatened Species

There are no Threatened or Endangered Species known to live or reproduce in the area, nor has critical habitat been designated for these species. However, the black-footed ferret is associated with black-tailed prairie dog towns, but ferret sightings have not been documented in the resource area since 1923. The northern Rocky Mountain wolf has been reported in the Frenchman Creek area in the northern portion of the Phillips RA, however, it's assumed the animals are wandering from the mountains to the plains because quality habitat does not exist in the resource area. The whooping crane and American and Arctic peregrine falcon may fly over the Phillips RA during the spring and fall migrations. The American peregrine falcon may nest along the Missouri River and may occur in the Little Rockies.

RECREATION

Recreational pursuits in Phillips RA include hunting, fishing, tourism, sightseeing, off-road vehicle use, wildlife observation, photography, hiking, horseback riding, camping, boating, snowmobiling and sport shooting.

Recreational activities affected by this undertaking include sport shooting or varmint hunting, wildlife observation and photography of prairie dogs and associated wildlife species. The other recreational pursuits would not be affected by actions considered in this analysis and therefore will not be discussed further.

No attempt has been made to put a dollar value on the non-quantifiable costs of wildlife observation and photography. However, it's assumed that these costs would fall within the range of the sport shooter costs which have been quantified.

Sport shooting, in this case varmint hunting of prairie dogs, has become an important recreation activity with interest in this pursuit increasing substantially in recent years. Consequently, prairie dogs constitute a valuable recreational resource.

Prairie dog shooters encompass a wide range of interest levels. These levels range from the avid varmint hunter who invests large amounts of money in specialized equipment, and is willing to travel great distances for the opportunity to participate in this activity, to the local shooter who only travels a few miles and spends just part of a day shooting at prairie dogs.

The avid out-of-state prairie dog shooter is defined as an individual who travels 1,000-4,000 miles in a motor home, or a comparable overnight vehicle, has three specialized guns and associated equipment, spends 3-7 days hunting per year and shoots from 200-500 rounds per day.

Casual use is defined as the local shooter who travels from 100-200 miles in a pickup, uses 1 gun with specialized equipment, spends on the average 2 days hunting and shoots 100 rounds per day.

The incidental user is defined as the individual who travels 100 miles in a car or compact pickup, has 1 gun but no specialized equipment, spends only 1 day per year hunting and only shoots 50 rounds per day.

The very local avid shooter is defined as a rancher in the southern portion of the resource area who only has to travel 10 miles in a pickup, has 1 gun, spends up to 10 days per year hunting and shoots up to 100 rounds per day.

Finally there is recognized a degree of cursory use. This user is the individual who spends 5 minutes to 1 hour shooting prairie dogs while engaged in other pursuits. However, this degree of use is non-quantifiable and is not included in this analysis.

In 1976, an article appeared in *Shotgun News* which stimulated the growth of out-of-state interest in prairie dog shooting in the Phillips RA. During the summers of 1977 and 1978 the area experienced its highest degree of prairie dog shooting to date. However, in more recent years, interest and participation in this pursuit has declined mainly due to the high cost of travel. There has been an increase in inquiries to BLM about prairie dog shooting because of a similar article in a recent *Shotgun News*.

At the peak period of shooting interest, the resource area experienced 225 out-of-state hunter days per year. This represented 75 hunters spending an average of 3 days participating in this sport. Five-hundred hunter days per year were attributed to local sport shooters. This represents 220 hunters spending an average of 2.3 days each hunting prairie dogs. Thus, the resource area experienced 725 hunter days of prairie dog shooting during this period, while each participant averaged 2.5 hunter days.

The value of a hunter day ranges from a high of $325 per day for the out-of-state hunter to a low of $37 for the local shooter with an overall average of $105 spent per day.

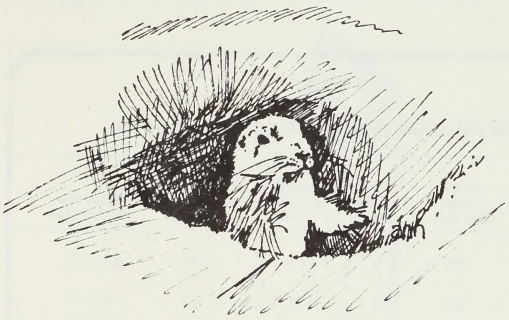
TABLE 7: SPORT HUNTING STATISTICS FOR PHILLIPS RESOURCE AREA 1976-1978[1]

Type of Hunter	Number of Participants	Days of Hunting	Hunter Days	Rounds Shot Per Day	Dogs Killed Per Day	Acres Shot Per Day	Acres Shot Per Year	Number of Hunter Day Opportunities Available	Value Per Hunter Day
Out-of-St. Very Avid	5	7	35	500	50	5	175	1,655	$324.56
Out-of-St. Avid	70	2.71	190	200	20	2	380	4,137	$216.75
Local High	50	2	100	100	10	1	100	8,274	$74.75
Casual Low	50	2	100	100	10	1	100	8,274	$46.84
Local Incidental	100	1	100	50	5	.5	50	16,548	$37.88
Very Local Avid	20	10	200	100	10	1	200	8,274	$36.52
	295		725				1,005		
Average		2.45		138.6	13.8	1.38		5,995	$104.54

[1]Information on how these figures were arrived at is available at the Phillips RA office.

The 725 hunter days represent the equivalent of shooting prairie dogs on 1,005 acres per year (Table 7). This level of opportunity represents an optimum. The number of prairie dogs eliminated depends on how many days are spent shooting, the number of rounds shot per day, the type of hunter and his ability with a gun, the weather and other factors. During the first day of shooting the hunter experiences the highest success rate, thereafter the success ratio decreases as the prairie dogs become more cautious and do not present themselves as targets as frequently. Thus it is virtually impossible to eliminate a prairie dog town by recreational shooting.

To make a satisfactory shooting opportunity, prairie dog towns should be at least 20 acres and preferably 50-100 acres in size. Towns of 320 acres or larger offer the optimum in a satisfying shooting experience, while towns smaller than 20 acres will not generally generate shooter interest. Therefore, there are 63 towns of 8,055 acres that would be of interest to the sport shooter, 33 towns from 1-19 acres would be of no interest. Fourteen towns of 20-49 acres would be of minimal interest. Seventeen towns of 50-99 acres would be of adequate interest. Twenty-nine towns of 100-319 acres would be of good interest while 3 towns of 320 acres or greater would be of optimum interest.



AESTHETICS

The Phillips RA contains a variety of visual resource classes. Three of the four visual resource management classes (II, III and IV) are represented in the resource area. A large majority of the resource area consists of rolling prairie country interspersed with shallow drainages and coulees. This type of terrain is generally rated as Class IV scenery. Nearly all of the known prairie dog towns in the Phillips RA occur within this management class rating.

SOCIAL AND ECONOMIC CONDITIONS

The Phillips RA is entirely within Phillips County and had a population on January 1, 1982 of 5,367 people and an area of 3,345,920 acres. With a population density of about one person per square mile the county is classified as rural by census definition. Approximately 35% of the population is engaged in agriculture. The remaining urban population is comprised of people engaged in gold mining, bentonite processing, gas field exploration and development, wholesale and retail trade, and city, county, state and Federal Government. Food, medical and financial services are located in Malta, the county seat, with limited services available in Saco, Dodson, Whitewater, Zortman and Loring. The crime rate in the county is lower than the Montana average and the quality of education is equal to that found throughout the state. The residents of the county exhibit attitudes and values typical of the western United States with the rural character of the area highly valued in their lifestyle.

Although being a rural county, with 35% of the population engaged in agriculture, the economic base of the county is rapidly shifting to mineral extraction and related industries. The mineral industries accounted for 29% of the total taxes accessed in the county in 1979 and 42.6% in 1980. This shift has thus far been accomplished without the adverse social and economic effects experienced in other communities similarily impacted in the western United States and has been made with little recognition by the majority of the local population. One explanation for this is that mineral industries have to the maximum extent employed local workers. If the mineral related industries continue growing the county may see reductions in its rural lifestyle and its farming and ranching economic base.

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A
TOTAL CONTROL

SOILS AND WATERSHED

The effects that prairie dogs have on the soils and watershed environment were studied in the Long Coulee AMP Environmental Assessment (EA). The soils and slopes of this allotment, as well as the character of the prairie dog towns present, were typical of the conditions found throughout the Phillips RA. Those studies show that in prairie dog towns there is a greater amount of bare ground and a lesser amount of litter and canopy cover than in adjoining areas outside prairie dog towns.

Plant and litter cover, litter weight, slope gradient and soil organic matter, according to Meeuwig (1970), are the most important soil factors influencing soil erosion. Because of the large amount of bare ground and small amount of canopy cover, soil erosion is greater on prairie dog towns than in adjoining areas outside towns. The greatest erosion of prairie dog town areas will occur where towns are located with a slope gradient greater than 3%.

Wind erosion is also significantly greater in prairie dog towns because of greater amounts of bare ground. Beasley (1972) found that maintaining protective cover on the soil surface is the most effective means of controlling wind erosion. The cultivating effect that the prairie dogs have by digging and piling soil into mounds and the destruction of sod also increases potential for wind erosion.

The significance of erosion is the loss of vegetation productivity. Munn and Meuggler (1976), found there is a 0.89 partial correlation between total productivity and thickness of the surface soil. Therefore, as the surface soil is eroded away, the total vegetation productivity could suffer.

A summary of estimated watershed impacts shows that with the current 8,275 acres of prairie dog towns there is approximately 31 acre-feet per year of sediment and 997 acre-feet per year of water being yielded from these towns. These sediment and water yields were calculated using yield potentials from *Prairie Potholes Grazing EIS* (Figure 3.4, page 36). The highest sediment and water yields were multiplied by the acres of prairie dog towns on each soil subgroup to determine these yields. To predict long-term sediment and water yields for each alternative, the mean of the lowest sediment and water yield values were multiplied by the acres of each soil subgroup (*Prairie Potholes Grazing EIS*, page 75). The effects of these accelerated sediment yields are downstream and offsite pollution. The effects of accelerated water yields are increases in sediment yields and downstream channel erosion.

The impact of this alternative would be a decrease in the erosion presently occurring on the prairie dog towns. In the long term, sediment yields would be reduced to 4.8 acre-feet per year and water yields would be reduced to 367.7 acre-feet per year. These figures do not include any impacts of mechanical treatments, and these yields would be reduced further if mechanical treatments were done. Approximately 74% of the prairie dog towns occur on soils that are suited to mechanical treatments.

VEGETATION

In this alternative, range conditions on the 8,275 acres of prairie dog towns on public lands within the Phillips Resource Area (Phillips RA) would improve from poor/fair to good/excellent condition over the long term. It's estimated that approximately 1% (a very insignificant amount) of these acres would not make the conversion to good/excellent conditions because they are cattle sacrifice areas (reservoirs, fence corners, etc.). However, there would be some improvement in the condition of these sacrifice areas and application of certain grazing treatments (rest rotation, etc.) could result in a quick recovery of some of these areas.

Vegetational changes would be considerable in this conversion. The short grass—half shrub—forb community, common to prairie dog towns, would revert to the short—midgrass plant communities common to good/excellent range condition in the Phillips RA.

Vegetation production studies in the Long Coulee Allotment showed an average of 210 pounds of forage per acre on two soil types inside prairie dog towns and an average of 560 pounds per acre on sites adjacent to prairie dog towns (Long Coulee AMP EA, 1981).

The increase in forage production would increase litter accumulation which has a positive influence on soil stability, fertility and moisture.

LIVESTOCK

The positive impacts of this alternative to livestock would include improving range conditions, more available forage, improved daily livestock weight gain and less encroachment by prairie dogs from public to private land. The 8,275 acres of prairie dog towns currently in poor/fair range condition are producing about 640 AUMs of forage per year. (AUM—Animal Unit Month. The amount of forage required for a cow/calf pair for a 1 month period.) Forage production would increase to about 1,500 AUMs per year as the controlled prairie dog towns achieve good/excellent range condition. This would result in a net increase of 860 AUMs per year over current forage production, without land treatments. Land treatments would substantially increase the number of AUMs gained. The current and anticipated forage production figures are based on 5.5 acres per AUM for good/excellent range condition and 13 acres per AUM for poor/fair range condition. These figures are averages based on range sites and soil groups common to the area and were used in field surveys during the *Missouri Breaks Grazing* and *Prairie Potholes Grazing EISs* efforts.

Under this alternative the 43 operators listed in Table 1 would no longer have prairie dog towns on public lands in their allotments.

Two allotments in Phillips RA (Long Coulee and East Dry Fork) have received livestock reductions based partially on prairie dog problems. The improving range conditions and subsequent increase in forage production could lead to some restoration of livestock grazing privileges in these allotments. Because no other allotments have received livestock adjustments based on prairie dog problems we would not expect any significant livestock increases based solely on complete prairie dog eradication. However, it is possible that land treatments (i.e. chisel plowing, scalping, seeding, fertilization) associated with prairie dog control and allotment management plan (AMP) implementation may provide a significant increase in forage production to justify some livestock adjustments in particular situations.

More and better quality forage would be available to livestock on old prairie dog towns. Livestock distribution and forage utilization would be dispersed over a larger area. Over time, the areas previously not affected by prairie dogs should receive less intense livestock use and should improve accordingly. The improvements in forage quality and quantity should result in better overall condition of the breeding herd and increased weight gains.

There are some problems at this time with prairie dog encroachment from both public to private and private to public lands. Total eradication of prairie dogs on public lands would eliminate the problem of encroachment from public to private land and its related impacts to the livestock operator. Encroachment from private to public land would remain a problem and would have to be dealt with on an individual allotment basis.

WILDLIFE

Big Game

Total control of 8,275 acres of prairie dogs on public lands would improve summer habitat in the short term. Early spring forbs, normally eaten or clipped by prairie dogs, would be available to big game species. This highly nutritious forage, especially forbs, is utilized in the spring to rebuild the physical condition of big game animals. Forbs are especially important to females during gestation and lactation (Verme, 1969).

In the long term, the controlled prairie dog towns would revert from a dominant forb complex to a grass complex. This change would decrease the availability of forbs during this critical spring period. Periodic deferment from livestock grazing until June 1 may then be necessary to provide this forage.

The removal of prairie dogs along with AMP implementation on public lands would improve all big game winter concentration areas associated with prairie dog towns. Prairie dogs rely on sight for their principal form of defense. When their sight is impeded by vegetation, prairie dogs clip and remove the vegetation. Many acres of big sagebrush have been removed by the prairie dog in big game winter concentration areas. With this alternative these areas would have an opportunity to revegetate with big sagebrush.

Game Birds

Total control of prairie dogs on public lands would provide additional forage and cover on the 8,275 acres previously utilized by prairie dogs. Spring and summer forbs are important to grouse, especially the chicks, during the first 4-6 weeks of life. Forage clipping by prairie dogs would cease and this vegetation would provide seasonal or yearlong cover for nesting, resting, brood rearing and loafing.

Some changes in plant composition would take place in the long term, thus reducing the availability of spring and summer forbs. Winter concentration areas for sage grouse would improve in quality and quantity when the prairie dogs are controlled. Periodic deferment from livestock grazing in the spring until June 1 may be necessary to provide adequate food and cover in areas previously occupied by prairie dogs.

Waterfowl

Total control of prairie dogs in Phillips RA may improve waterfowl nesting cover slightly where prairie dog towns are located adjacent to stock reservoirs and natural potholes. However, the total acres of prairie dog towns presently in the resource area, comprises only a small percentage of the habitat available to nesting waterfowl. Other land and grazing treatments proposed in the individual AMPs would probably play a larger role in providing better waterfowl nesting and brood cover. Fencing of selected reservoirs to eliminate the trampling of shoreline vegetation by livestock would benefit waterfowl more than prairie dog control itself.

Extreme care would be necessary when poisoning is proposed for areas adjacent to reservoirs used by waterfowl in late summer and fall. Some waterfowl species feed extensively on small grains at that time of year and the potential for ingestion of treated grain certainly exists. It may be necessary to use gas cartridges or place bait in the burrows close to reservoirs.

Nongame Animals

Total control of 8,275 acres of prairie dogs on public lands would eliminate the prairie dog and remove the unique habitat which attracts more than 30 other wildlife species. Although most of the 30 plus species are not dependent on prairie dog towns for survival, the opportunity for co-existence on dog towns would be lost. It should be noted that these species are associated, not dependent upon prairie dog towns. Eagles, hawks, coyotes, fox and badgers prey on prairie dogs when they're available. Otherwise, the predators utilize prey such as ground squirrels and field mice.

Almost 100% of the prairie dogs killed by zinc phosphide will be in burrows below the ground surface. Those eaten by burrowing scavengers will not transmit a lethal dose of zinc phosphide.

The burrowing owl utilizes unoccupied burrows in prairie dog towns. The owl population could increase in the short term with the availability of an additional 8,275 acres of unoccupied burrows except where mechanical treatments follow control. However, during the long term, as the burrows deteriorate, the potential habitat would decrease and the owl population may be reduced but many would seek the unoccupied burrows of other ground dwelling animals.

The mountain plover population may be reduced in Phillips RA with elimination of prairie dog towns on public lands. However, the plover could seek out the habitat of prairie dog towns on private land and the adjacent Charles M. Russell National Wildlife Refuge (CMR) lands, if populations there were not at capacity. Although a high incidence of plovers exist in association with prairie dog towns, it's not the only place they've been observed. A few mountain plovers have been found in the resource area away from prairie dog towns. Similar habitat on blue grama ranges discussed by Graul (1972) does exist in Phillips RA, however, our preliminary bird surveys have not identified the plover on these sites (BLM-6602 Studies).

Fisheries

Complete control of prairie dogs could benefit fisheries reservoirs in the long term. Accelerated siltations of seven fisheries reservoirs, which have prairie dog towns partially or wholly within the first mile of their upstream drainages, could be reduced and the potential longevity of the reservoirs for fish populations increased if vegetation returns after prairie dog control. A lower siltation rate would improve water quality for fish reproduction and help maintain adequate water depths. Other land and grazing treatments within the AMPs, could also impact siltation rates and shoreline vegetation. The replacement of prairie dogs with increased livestock grazing pressure may not change the water quality of the fisheries reservoirs to any extent. Extreme care should be taken when handling poisons on prairie dog towns near fisheries reservoirs. It might be advantageous to place bait in burrows or use gas cartridges when burrows are located close to water.

Elimination of the nine prairie dog towns within a mile and a half of Beaver Creek would probably have no effect on the fisheries resource of the creek. The total area of these towns is only a small fraction of the total land area draining into Beaver Creek.

Endangered and Threatened Species

Total control would eliminate the potential habitat for the black-footed ferret on public lands in the Phillips RA. However, a ferret has not been seen in the area for about 60 years and the CMR would still contain habitat for black-footed ferrets.

RECREATION

This alternative would eliminate all photography, wildlife observation and sport shooting opportunities of prairie dogs in the Phillips RA. The current 725 utilized hunter day opportunities and 5,270 currently unused hunter day opportunities, would be eliminated.

However, an aggressive program developed to promote sport shooting in conjunction with the control program would be a benefit to varmint hunters. This would satisfy the sport shooting interest only for the short term. The resource area would experience a loss of about 20% or 1,200 hunter day opportunities per year until none were left (Table 7). Therefore, the resource area could satisfy the current level of interest for only 5 years or throughout the short-term period. No long-term benefits or uses would be realized under this alternative. There would be no method to mitigate the effects of this alternative on sport shooting as it would conflict with its intent. Overall, this alternative would have a serious and significant adverse impact to the varmint hunters by eliminating all shooting opportunities of prairie dogs on public lands in the Phillips RA.

AESTHETICS

Complete control of prairie dogs would change the character of the landscape slightly, on naturally rehabilitated town areas, as more and taller vegetation reoccurred over the long term. This may be more pleasing to some and less pleasing to others as the color and tone of prairie dog towns somewhat breaks the monotonous character of the prairies.

Towns that were mechanically treated and seeded would represent a more substantial change to the landscape, but again, the effect on the viewer may be more or less pleasing depending on his personal desires.

SOCIAL AND ECONOMIC CONDITIONS

A computer program was developed at the Montana State Office of the Bureau of Land Management (BLM) to assist in estimating the benefits and costs of public rangeland investments designed for implementation in the AMP. Public expenditures for and benefits resulting from the control of prairie dogs would be data inputs into the program to determine the benefit-cost analysis of the activity plan, an AMP. ACCORDINGLY, THE BENEFIT-COST ANALYSIS ON PRAIRIE DOG CONTROL WOULD BE DEFERRED AND ANALYZED AS A RANGELAND INVESTMENT COMPONENT OF THE AMP.

An example of a benefit-cost for an AMP (Long Coulee) plus a benefit-cost analysis form is shown in Appendix 9.

A benefit-cost analysis for the control of prairie dogs, mainly from a public land management point of view, was made on the Buffalo National Grasslands in South Dakota on the Wall Range District of the Nebraska National Forest, U.S. Forest Service (USFS). This study, *An Economic Analysis of Prairie Dog Control*, by Alan R. Collins and John P. Workman, was conducted with the primary objective being to determine the net dollar benefits from vegetation changes due to prairie dog control. This analysis is particularly relevant because the *worst* case situation uses this data for rate of spread, competition for forage by grazing livestock and the same method of control. They also experienced a higher than normal expansion rate from an area outside the control area. Their study showed benefit-costs of $1.15 for the USFS acting as an agent for society and $1.79 for the rancher. The abstract for this study follows:

> Prairie dog control was found to be economically feasible on the Conata basin in South Dakota given future annual maintenance control to prevent prairie dog re-invasions. Economic analyses were made from U.S. Forest Service and rancher viewpoints. The present net worth for each viewpoint was $40,113 for the U.S. Forest Service and $155,935 for ranchers. On a per hectare basis, net returns are $3.40 for the U.S. Forest Service and $11.40 for the ranchers. In order for prairie dog control to remain economically feasible, projected annual maintenance control for the U.S. Forest Service must be below 7.5% of the initially controlled acreage in the control program (12% for the rancher viewpoint).

The Environmental Protection Agency (EPA) approved method of control for prairie dogs using zinc phosphide treated oats is labor intensive and time-consuming. At present, this is the only method approved for prairie dog control on public lands. If, in the future, other chemicals become available, a different method of control with lower costs could result. Due to the labor required with this method of control, the Volunteer Program in Montana State Office Instruction Memorandum MT-82-98 (Appendix 10) is being considered as a means to use rancher donated labor and three-wheeled cycles with BLM, U.S. Fish and Wildlife Service (FWS) and State of Montana providing necessary supervision and clearances.

While most costs for prairie dog control and some benefits can be quantified, there are a number of non-quantifiable or non-market benefits and costs. Although non-quantifiable benefits are probably not of themselves justification for control, they are resulting benefits of control. The spread of prairie dogs from public to private land would be slowed with control and this would result in a benefit to private landowners. Unless the private landowners could prove loss in forage or AUMs they would be non-quantifiable. Control would slow watershed damage, soil loss and resultant siltation in reservoirs and streams. Improved range condition and wildlife habitat would result from control. Non-quantifiable losses as a result of control include sight-seeing, photography and black-footed ferret habitat.

Alternative A calls for eradication of prairie dogs on 8,275 acres in a 5 year period. Quantifiable benefits of 8,600 AUMs would result in the remaining 10 years of the long term. Presently the value of an AUM gained is $6.55 (*Prairie Potholes Grazing EIS* and IM No. MT-82-50) (Appendix 11). Known costs associated with these benefits include costs of zinc phosphide at 24¢ per acre and oats at 6¢ per acre. Gas cartridges for follow up work cost approximately 16¢ each. Contract labor to accomplish control was quoted at $5.50 per acre (Sullins, M., 1982, personal communication). Volunteer labor to accomplish control would be $1.00-$1.25 per acre. Land treatment and seeding may be necessary but these impacts have been analyzed in both the *Prairie Potholes Grazing* and *Missouri Breaks Grazing EISs*. Typical costs associated with chisel plowing range from $15-$20 per acre, scalping at $20-$30 per acre and seeding at about $10 per acre. Under the total control alternative, approximately $75,800 per year spent nationwide by recreational shooters would be lost or spent elsewhere since all prairie dogs would be eliminated on the public land.

The figures expressed above are subject to change and calculation of benefit-costs for AMPs will use whatever figures are correct at the time.

This alternative would not improve ranch income on the 43 effected AMPs in the short term. Prairie dog control, mechanical treatments and range facilities would take certain pastures out of production in the short term. However, these pastures would be available in the long term and ranch income, on all 43 AMPs, would increase proportionately with the effectiveness of the individual AMPs.

This alternative would have both positive and negative effects on the attitude toward BLM. The control of prairie dogs and increased forage for livestock, wildlife and watershed would produce favorable attitudes from ranchers, those associated with the ranching industry and a segment of the environmental community. This alternative proposes the implementation of 43 AMPs, 13 more than scheduled, which would mean greater governmental presence and control in a basically conservative ranching community. To the extent that AMPs improve range condition, carrying capacity and rid the Phillips RA of prairie dogs and doesn't infringe on the way the operator manages his ranch, the effect on his attitudes would be positive. Recreationists who varmint hunt, photograph or observe prairie dogs, and associated species, would have a negative attitude toward the BLM with the elimination of their interest.

ALTERNATIVE B
MANAGEMENT LEVEL I

SOILS AND WATERSHED

The impacts of this alternative would be the same as Alternative A for the controlled prairie dog towns. The impacts of managing the remaining towns at a predetermined size would stop the increase in erosion for the short term. In the long term, erosion would continue on the remaining towns. In the long term, sediment yields would be reduced to 8.2 acre-feet per year and water yields reduced to 411 acre-feet per year.

VEGETATION

The major impact of this alternative on vegetation would be that 7,375 acres of public land in poor/fair condition would improve to good/excellent range condition in the long term, similar to that discussed in Alternative A. About 900 acres of prairie dog towns would remain in poor/fair condition.

Vegetational responses would be the same as those described in Alternative A on 7,375 acres. The exception being that 900 acres would remain in a short grass—half shrub—forb community. It could also be expected that the areas managed as prairie dog towns would further deteriorate in range condition as the age of the town increases and prairie dogs are held at a limited acreage.

LIVESTOCK

About 7,375 acres of prairie dog towns currently in poor/fair range condition would improve to good/excellent condition in this alternative. This would result in an increase of about 775 AUMs of forage per year in the long term.

This alternative would remove prairie dogs from 28 of the 43 allotments. Prairie dogs would be managed in 15 allotments as displayed in Table 3.

No livestock reductions are anticipated at this time based on having a managed prairie dog town within an allotment. As in Alternative A, possible land treatments associated with prairie dog control and AMP implementation could result in some livestock increases.

The improved range conditions resulting from this alternative would have positive impacts on livestock as discussed in Alternative A.

Encroachment of prairie dogs onto private land would be minimal as the prairie dog towns in this alternative would be managed at the proposed acreage levels and would not be allowed to expand.

Encroachment from private to public land would remain a problem to be dealt with on an individual allotment basis.

WILDLIFE

Big Game

Implementation of this alternative would reduce the prairie dog population by about 7,375 acres, thus improving the summer and winter big game habitat in both the short and long term, as discussed in Alternative A. However, competition between big game and prairie dogs would continue on the 900 acres of managed towns.

Game Birds

This alternative would reduce the prairie dog population by 7,375 acres and would improve the quality and quantity of the summer and winter range in both the short and long term, as discussed in Alternative A. Competition would remain, especially between sage grouse and prairie dogs, on much of the 900 acres left for management.

Waterfowl

Management and control of prairie dogs at a stable level of 900 acres on public lands in Phillips RA would probably have little impact on waterfowl populations and habitat, unless accompanied with other land and grazing treatments within the individual AMPs which promote shoreline vegetation and occasional rest of pastures. Livestock grazing is likely to utilize much of the vegetation presently removed by prairie dogs, unless selected areas around reservoirs are fenced to exclude livestock. Care should be taken when poisoning near reservoirs as discussed in Alternative A.

Nongame Animals

Control of 7,375 acres of prairie dog towns on public lands would reduce the prairie dog population and unique habitat which attracts more than 30 other wildlife species to 900 acres. Predators such as eagles, hawks, coyotes, fox and badgers would make greater use of other prey species (ground squirrels and field mice) as the number of prairie dogs decrease.

The 7,375 acres of unoccupied burrows would be available to the burrowing owl in the short term, except where mechanical treatment followed control. In the long term, the utility of the controlled acres would decrease as discussed in Alternative A while the managed acres would remain about the same.

Habitat for the mountain plover would be reduced by 7,375 acres. The mountain plover would continue to inhabit the 900 acres of managed prairie dog towns. The plover population may move to prairie dog towns on private land, to towns on the CMR or onto blue grama habitat as discussed in Alternative A.

Fisheries

Controlling prairie dogs on all but 900 acres of public lands in Phillips RA would be of benefit to the seven fisheries reservoirs as discussed in Alternative A. Siltation of these reservoirs would be reduced if vegetation returns to the dog town after poisoning. Other land and grazing treatments within the AMPs may also help reduce siltation and help prolong the lives of these reservoirs. Replacement of prairie dogs with increased livestock grazing, however, would probably not benefit the fisheries reservoirs. Extreme care should be taken when handling poisons as discussed in Alternative A.

Elimination of seven of the nine dog towns within a mile and a half of Beaver Creek would probably have no effect on the fisheries resource of the creek, as discussed in Alternative A.

Endangered or Threatened Species

This alternative would reduce the potential habitat for the black-footed ferret by 7,375 acres thus leaving 900 acres of habitat.

RECREATION

Under this alternative the resource area would lose 72 of the currently utilized hunter day opportunities and all of the 5,270 unused hunter day opportunities. In the long term, the Phillips RA would have available 652 hunter day opportunities, 90% of current use levels.

The resource area would experience a 20% decrease or a loss of 1,067 available hunter day opportunities per year in the short term until the 652 hunter day opportunity figure is reached in year 6 (Table 7).

This alternative would offer 15 towns of 900 acres, all would be of some interest to sport shooters. Six towns would be maintained at from 20-50 acres, generating only minimal shooting interest. Eight towns would be maintained at 50-100 acres which would generate adequate interest. One town would be maintained at over 100 acres (140 acres) generating good interest. No town of over 320 acres would be maintained in this alternative to offer optimum interest.

During the short term, there would be more than enough hunter day opportunities available at present use levels. However, in the long term, shooting interest would probably decline significantly as the area would not be able to offer sufficient shooting opportunities to attract the out-of-state varmint hunter. Larger towns attract the more avid shooters. The larger the town the longer one can shoot without having to move. Thus, the largest towns offer the most satisfying experience to the more avid hunters. There would continue to be some level of local interest, but less than present levels of use.

It would appear that the 900 acres would be controlled by shooting in only one year at present use levels. However, shooting would never completely eradicate a prairie dog town. Shooting only reduces the density of dogs in the towns and not the number of acres of towns. Shooting usually kills off the young animals living on the town periphery, while doing little damage to the breeding population within the town core. However, the expansion rate of the town would be reduced or eliminated altogether. Shooting would also help slow town growth and maintain town size. The yearly reproduction rate of prairie dogs would replenish the town's population. Therefore, shooting opportunities would probably remain fairly constant.

To mitigate these impacts the resource area may have to develop a recreation management plan to aid and encourage shooting interest. Managed towns would be signed to identify their locations. Only certain towns or a selected percentage of the towns would be open to shooting each year. A system of rotation may be necessary so towns would not become shot out. This may help maintain a satisfactory shooting experience in those towns open to shooting for any given year. Road signs, directing shooters to the managed towns, as well as road building and maintenance would help promote shooting interest. A continued high level of shooting interest would help reduce the costs of the yearly maintenance in controlling town size in the long term.

AESTHETICS

Consequences to viewers would be similar to those described in Alternative A.

SOCIAL AND ECONOMIC CONDITIONS

Implementation of this alternative would enable effected operators within allotment management plans to improve range condition over the long term on 7,375 acres resulting in an increase of 7,750 AUMs. The elimination of prairie dogs on 7,375 acres would result in lost hunter days valued at $7,560.

Ranch income would improve proportionately to the effectiveness of all 43 AMPs, even though 15 of the AMPs would contain managed prairie dog towns.

The attitudes of ranchers would be similar to Alternative A. However, the attitudes of the recreationists and a segment of the environmental community would improve with the presence of 15 managed prairie dog towns.

ALTERNATIVE C MANAGEMENT LEVEL II

SOILS AND WATERSHED

The impacts of this alternative are the same as Alternative B with consideration of the different levels of control and/or management. In the long term, sediment yields would be reduced to 12.5 acre-feet per year and water yields reduced to 463.5 acre-feet per year.

VEGETATION

In this alternative about 5,630 acres of prairie dog towns currently in poor/fair range condition would improve to good/excellent condition in the long term.

Vegetation would continue to deteriorate on the 2,640 acres of managed prairie dog towns as the towns progress in age and prairie dogs are held on confined areas.

Impacts on vegetation in this alternative would be very similar to those in Alternative A.

LIVESTOCK

Under this alternative about 5,630 acres of prairie dog towns, currently in poor/fair range condition, would improve to good/excellent range condition resulting in an increase of about 590 AUMs per year over the long term.

This alternative would remove prairie dogs from 16 of the 43 allotments. Prairie dogs would be managed in 27 allotments as displayed in Table 4. Livestock adjustments, impacts to livestock and prairie dog encroachment would be as discussed in Alternative B.

WILDLIFE

Big Game

Implementation of this alternative would reduce the prairie dog population by about 5,630 acres, thus improving the summer and winter big game habitat in both the short and long term as discussed in Alternative A. However, competition between big game and prairie dogs would continue on the 2,640 managed acres.

Game Birds

Reducing the prairie dog population by 5,630 acres and would improve the quality and quantity of the summer and winter range in both the short and long term as discussed in Alternative A. Competition would remain, especially between sage grouse and prairie dogs on much of the 2,640 managed acres.

Waterfowl

Management and/or control of prairie dogs at a stable level of 2,640 acres on public lands in Phillips RA would probably have little impact upon waterfowl populations and habitat, unless accompanied with other land and grazing treatments within individual AMPs which promote shoreline vegetation and occasional rest of pastures. Livestock grazing is likely to utilize much of the vegetation presently removed by prairie dogs, unless selected areas around reservoirs are fenced to exclude livestock. Care should be taken when poisoning near reservoirs as discussed in Alternative A.

Nongame Animals

Control of 5,630 acres of prairie dogs from the public lands would reduce the prairie dogs and unique habitat which attracts more than 30 other wildlife species to 2,640 acres. Predator-prairie dog relations would be similar to those discussed in Alternative B.

The 5,630 acres of unoccupied burrows would be available to the burrowing owls in the short term. In the long term, the utility of the controlled acres would decrease, as discussed in Alternative A, while the managed acres would remain about the same.

Habitat for the mountain plover would be reduced by 5,630 acres. The mountain plover would continue to inhabit the 2,640 acres of managed prairie dog towns. The mountain plover population may move to prairie dog towns on private land, to towns on the CMR or onto blue grama habitat as discussed in Alternative A.

Fisheries

Controlling prairie dogs on all but 2,640 acres of public lands in Phillips RA would be of benefit to five of the seven fisheries reservoirs which currently have prairie dog towns partially or wholly within the first mile of their immediate upstream drainages, as discussed in Alternative A. Extreme care should be taken when handling poisons on dog towns near fisheries reservoirs, as discussed in Alternative A. The two reservoirs still having prairie dog towns within their immediate upstream drainages would probably experience increased siltation and lowered water quality as the condition of the dog towns continues to deteriorate and more runoff unchecked by vegetative cover occurs.

Elimination of six of the nine dog towns within a mile and a half of Beaver Creek would probably have no effect on the fisheries resource of the creek, as discussed in Alternative A.

Endangered or Threatened Species

This alternative would reduce the potential habitat for the black-footed ferret by 5,630 acres; leaving 2,640 acres of habitat.

RECREATION

Under this alternative there would be 1,915 hunter day opportunities available. This would accommodate the present use level of 725 hunter days, however, the unused portion would be decreased by 80%. This would leave 1,190 unused hunter day opportunities and allow the Phillips RA to expand this recreational activity about 1.5 times its present level. The resource area would experience a 20% decrease per year in unused hunter day opportunities or a loss of 815 available unused hunter day opportunities per year in the short term until the 1,915 hunter day opportunity figure is reached in year 6 (Table 7).

This alternative would offer 33 towns of 2,640 acres that would be of interest to sport shooters. Sixteen towns would be maintained at from 20-50 acres generating only minimal interest. Seven towns would be maintained at from 50-100 acres generating adequate interest while 10 towns would be maintained at from 100-320 acres which would generate good interest. However, no towns would be maintained at over 320 acres to offer optimum interest.

During the short term, there would be more than enough hunter day opportunities available to satisfy present use levels. This alternative would allow expansion of this resource use, therefore, there would be no adverse impact to sport shooting interests. This alternative would offer ample interest and opportunities to all interest levels as there would be a significant number of towns available at varying sizes to shoot. Shooting would possibly help contain the expansion of the managed towns as discussed in Alternative B.

To mitigate the above impacts a recreation management system would be set up on the managed town similar to that mentioned in Alternative B.

AESTHETICS

Consequences to viewers would be similar to those described in Alternative B.

SOCIAL AND ECONOMIC CONDITIONS

In this alternative, implementation of the AMPs would affect 5,630 acres which would go to good/excellent range condition yielding 5,900 AUMs. No hunter day dollars would be lost under this alternative.

Ranch income would improve proportionately to the effectiveness of all 43 AMPs, even though 27 of the AMPs would contain managed prairie dog towns.

The attitudes of ranchers would be similar to those discussed in Alternative A. However, the attitudes of the recreationists and a segment of the environmental community would improve with the presence of the 27 managed prairie dog towns.

ALTERNATIVE D NO CONTROL

SOILS AND WATERSHED

The impact of this alternative would be an increase in erosion, decrease in soil productivity and an increase in offsite pollution. In the short term, this would occur on all existing prairie dog towns and in the long term, on all new prairie dog towns. Also, from evaluation of soil maps of the Phillips RA, there is an ample area of suitable habitat for prairie dogs, so this would not be a limiting factor to projected expansion rates (Figure 5). In the long term sediment yields would increase to approximately 1,000 acre-feet per year and water yields to approximately 31,000 acre-feet per year.

VEGETATION

In this alternative 8,275 acres of prairie dog towns on public lands in 1981 have the potential for increasing to 298,380 acres in the long term. Range condition figures in the *Missouri Breaks Grazing* and *Prairie Potholes Grazing EIS* documents show that 62% of the southern portion of the resource area is in good range condition.

These figures suggest that 179,865 acres of public rangelands currently in good range condition could deteriorate to poor/fair range condition in the long term. Range productivity and forage production would suffer significant adverse impacts if prairie dog expansion were to take place.

The remaining 110,240 acres already in poor/fair range condition would deteriorate further in the long term with the presence of prairie dogs.

Often grazing reductions cannot keep pace with prairie dog expansion and the resulting range problems. Studies undertaken by USFS in South Dakota have shown that prairie dog towns increased about 30% during the same time period in which 32% of livestock grazing was suspended. The reductions in grazing did not keep pace with increasing prairie dog use on the remaining vegetation and declining range conditions (USFS, 1978, page 23). Consequently, the livestock grazing pressure, along with the prairie dogs, accelerated the deterioration of the range.

The short and midgrass plant communities common to good range conditions in the resource area would revert to the short grass—half shrub—forb plant communities typical of young prairie dog towns as they are taken over in the expansion period. Bonham and Lerwick (1976) noted that the diversity of plant species on prairie dog towns was greater than adjacent lands. Most of the new species were forbs. However, they stated that prairie dogs altered the plant species composition towards those plants which are tolerant to prairie dog grazing. It can be assumed that most plant species, tolerant to prairie dog grazing, would also be tolerant to livestock grazing. However, due to the clipping of plants by prairie dogs the vegetation becomes low and less available to livestock.

It is common on some of the older, larger towns that the vegetation is almost completely denuded by the actions of prairie dogs. The aboveground portions of the plants are eaten or clipped till virtually all vegetation is gone. The prairie dogs then dig up the root systems of these plants. The topsoil is no longer stable and soon disappears as a result of wind and water erosion. The resulting soils support very little, if any, vegetation.

Another impact expected would be the spread of prairie dog towns from public lands to private and state land. This would have an additional adverse impact to the range conditions and vegetation producing potential of the resource area as a whole.

LIVESTOCK

In this alternative, 179,865 acres of public land currently in good range condition would deteriorate to poor/fair range condition in the long term. This would result in the yearly loss of 18,870 AUMs from present levels. These AUMs are currently allocated to livestock. The loss of these AUMs could amount to a reduction of 3,145 cattle for a 6 month grazing season.

At this time, livestock reductions based on prairie dogs have been minimal. As prairie dog expansion escalates and rangelands deteriorate, the areas not effected by prairie dogs would receive more intense grazing pressure. Declining range condition and trend on expanding prairie dog towns in association with over-utilization of remaining rangelands would undoubtedly lead to livestock adjustments. This could affect most allotments in south Phillips RA.

Another problem associated with deteriorated range conditions is the invasion and establishment of noxious weeds. Some of these plants can cause a variety of ailments to livestock including poisoning, bloat and photosensitization.

Expansion of prairie dogs onto private lands would be a major concern in this alternative. With the scattered landownership pattern and the magnitude of prairie dog expansion as suggested in this alternative, expansion by prairie dogs onto private lands would be unavoidable. Control of this problem would place a very significant, time-consuming and economic hardship on the private landowner.

Livestock reductions, based on lowered carrying capacities, and expansion of prairie dogs onto private land could result in lawsuits against the BLM by landowners and livestock operators.

WILDLIFE

Big Game

No control of prairie dogs on public lands would significantly impact big game summer habitat in both the short and long term. Early spring forbs would be eaten or clipped on about 298,380 acres by the end of the long term. Competition for the highly nutritious forage, especially forbs, could slow the recovery of physical condition by female antelope and mule deer, thus reducing the fawn crop.

The winter ranges of both antelope and mule deer would continue to deteriorate as the prairie dogs continue to expand. Big sagebrush, common to many of the prairie dog towns, would be continuously clipped where it impedes prairie dog expansion. Thus, important wintering areas in the resource area would be severely reduced or destroyed as prairie dogs expand.

Game Birds

No control of prairie dogs on public lands would significantly remove forage and cover on the 298,380 acres which they could occupy by the end of the long term. Prairie dogs would compete with sage grouse for spring and summer forbs. The lack of forbs important to the chick during the first 4-6 weeks of life may reduce the number of young which survive. The clipping of forage by prairie dogs would remove the seasonal or yearlong cover used by the birds for nesting, resting, brood rearing and loafing. Winter cover would be removed by the prairie dog and sage grouse would be impacted severely where winter concentration areas exist in the path of expansion.

Waterfowl

Continued unlimited expansion of prairie dog towns would negatively impact waterfowl in the long term. Expansion to 298,380 acres would ultimately destroy large amounts of nesting cover near stock reservoirs in the southern portion of Phillips RA. As prairie dogs remove forage, livestock would probably move to the remaining areas not inhabited by prairie dog towns and over-utilize the vegetation there, further damaging waterfowl nesting cover. Waterfowl would be forced to nest in less desirable locations where production would be decreased.

Nongame Animals

The expansion of prairie dogs to 298,380 acres by the end of the long term would significantly increase the acres of prairie dogs. The unique habitat, which attracts more than 30 other wildlife species, would significantly increase as the prairie dogs expand. The 30 plus species would increase in relation to the expanded habitat.

The prairie dog would become the primary prey of eagles, hawks, coyotes, fox and badgers. These predator species would increase in relation to the available prey base.

The number of unoccupied burrows would significantly increase as the prairie dogs expand. This would provide additional habitat for expansion of the burrowing owl population.

Habitat conditions would increase for the mountain plover. The low growing vegetation on the 298,380 acres of prairie dog towns would provide a significant amount of additional nesting and summer habitat.

Habitat of nongame animals which are not associated with prairie dog towns would decrease with the expansion of prairie dogs. Species which require dense habitat for some or all of their seasonal or yearlong activities could be significantly impacted as vegetation is removed. Nongame species such as Brewer's sparrow may be severely reduced or eliminated if most of the big sagebrush is removed.

Fisheries

Continued expansion of prairie dog towns would impact fisheries reservoirs and Beaver Creek. Increased siltation from runoff, unchecked by vegetative cover, would occur in possibly all 17 fisheries reservoirs in the southern portion of Phillips RA and also in Beaver Creek as more and more of the drainage area of the creek is inhabited by prairie dogs. Fish reproduction would be decreased as spawning areas are covered with sediment. Some reservoirs would no longer be deep enough to sustain fish populations through the winter months due to excessive siltation caused partially by runoff from prairie dog towns.

Endangered and Threatened Species

No control would provide 298,380 acres of potential habitat for the black-footed ferret on public lands in the Phillips RA. Being contiguous to the CMR the resource area would provide additional habitat for the success of any proposed black-footed ferret reintroductions.

RECREATION

With this alternative the unused hunter day opportunities would increase yearly from 5,995 to about 213,000 in the long term, an increase of over 3,550%. The area would probably become a known shooters paradise with 298,380 acres in prairie dogs.

An agressive promotional campaign and recreation management plan may help to increase shooter interest over the present level. However, even in the best case situation, sport shooter demand would probably never be great enough to take full advantage of expected prairie dog expansion. Little could be done to control prairie dog expansion through sport shooting. Recreational sport shooting would never control prairie dog expansion in this alternative. Shooting may be an effective method of controlling expansion on small towns and in areas with a small number of acres in prairie dogs, but would be of no use to help reduce or control the size and number of towns that would be in the resource area at the end of the long term.

All towns would expand to the size that they would offer either good or optimum interest to the sport shooter.

AESTHETICS

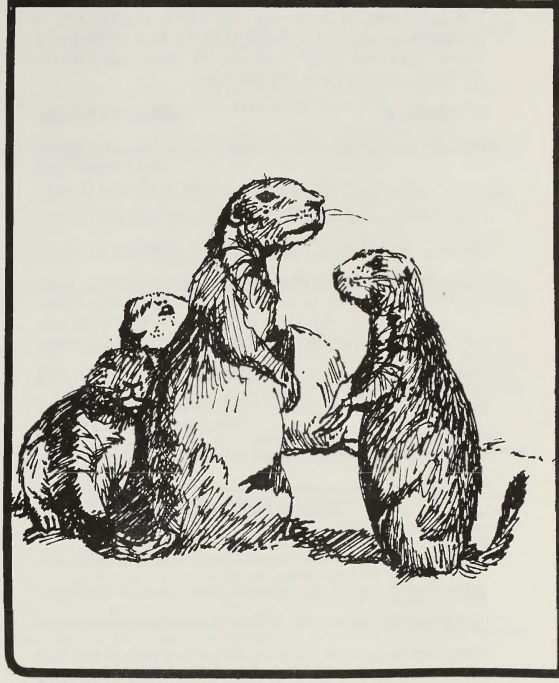
Taking no action against anticipated prairie dog expansion would possibly result in large areas being converted from the colors apparent in prairie grasslands to the monocolor brown present on dog towns. This would represent a slight negative impact to viewers.

SOCIAL AND ECONOMIC CONDITIONS

Under this alternative, it is possible in the long term for 179,865 acres of good/excellent range condition to deteriorate to poor/fair condition with a resultant loss of 188,700 AUMs. The value of an AUM lost is $13.42 (Benefit-Cost Procedures, IM No. MT-82-50). Allowing prairie dogs to expand throughout the county could lead to a significant negative impact to the social well-being of permittees whose operations are, in a large part, dependent on public lands in their allotment. A few might be forced out of business, thus negatively impacting the social well-being of local businessmen. Continued sport shooting, to whatever demand allows, could offset this loss to local businessmen.

This alternative would have both positive and negative effects on the attitude toward BLM. No control of prairie dogs and decreased forage for livestock, wildlife and watershed would produce negative attitudes from ranchers, those associated with the ranching industry and a segment of the environmental community. This alternative proposes the implementation of 28 AMPs, which would mean less governmental presence and control in a basically conservative ranching community. Recreationists who varmint hunt, photograph or observe prairie dogs and associated species would have a positive attitude toward the BLM with the enhancement of their interest.

CHAPTER 5
CONSULTATION AND COORDINATION



An active public involvement process aided in developing this environmental assessment (EA).

A letter was sent to each permittee on November 20, 1981, asking for prairie dog information. Permittees who had prairie dog towns the Bureau of Land Management (BLM) knew about were asked to verify the information. The remaining permittees were asked for any additional information.

On November 25, 1981, a news release was issued which discussed the request for prairie dog information that BLM was making of the permittees. The news release went on to say that BLM personnel would be available in the Phillips Resource Area (Phillips RA) to discuss prairie dog locations on December 2nd and 3rd. A trailer was set up at First Creek Hall on December 2nd and moved to the intersection of Highway 191 and the Dry Fork Road on December 3rd. Hours were 9:00 a.m. to 9:00 p.m. on both days.

On December 2nd, seven permittees came to First Creek Hall and on December 3rd, six permittees came to the intersection of Highway 191 and the Dry Fork Road.

The November 25, 1981, news release also mentioned that a meeting would be held in the Phillips RA Office to help shape a long range prairie dog management plan. The panel would consist of local landowners, state wildlife and agriculture personnel, a Grazing Advisory Board member, local ranchers, local officials, recreationists, environmental interests and other Federal agencies. A letter was sent to 15 potential panel members on November 10, 1981. Potential panel members consisted of :

Sherman Doucette ..... Phillips County Commissioner

Francis Jacobs ..... Phillips County Planning Board

Ralph Fries ..... Charles M. Russell National Wildlife Refuge Refuge Manager

Hank Fischer ..... Defenders of Wildlife

Richard Johnson ..... Fish, Wildlife and Parks Regional Supervisor

Henry Nesbit ..... South Phillips CSGD

James Phelps ..... National Audubon Society

Bill Rightmire ..... Fish and Wildlife Service

Greg Smitman ..... Bureau of Indian Affairs

Ross Robinson ..... District Advisory Board

Monte Sullins ..... Montana Department of Agriculture

Fred Veseth ..... Landowner

Andrew Waritz ..... Sport Hunting

John Grensten ..... Bureau of Land Management Wildlife Biologist

Jerry Pierce ..... Bureau of Land Management Range Conservationist

The panel met on December 12, 1981, at 8:00 a.m. in the conference room of the BLM office, Malta, Montana. Those potential panel members or their representatives who were able to attend were:

ATTENDEE	REPRESENTING
Francis Jacobs	Phillips County Planning Board BLM Permittee Private Landowner in Phillips County
Donald Fortenbery	CMR National Wildlife Refuge
Bruce Campbell	MT Dept. of Fish, Wildlife and Parks
Henry Nesbit	South Phillips Coop. State Grazing Dist. BLM Permittee Private Landowner in Phillips County Buckhorn Store & Cabins, Zortman, Montana
James Phelps	Montana Audubon Council
Greg Smitman	Bureau of Indian Affairs Fort Belknap Reservation
Monte Sullins	Montana Department of Agriculture
Fred Veseth	BLM Permittee Private Landowner in Phillips County Local Varmint Shooter
Andrew Waritz	Sports Shooters
John Grensten	BLM—Wildlife Management Biologist
Jerry Pierce	BLM—Range Conservationist

The panel discussed the anticipated impacts of the two extremes, total control and no action, and developed criteria to assist BLM in developing one or more additional alternatives. A summary of the panel discussion and proposed alternatives was contained in a news release issued January 18, 1982. Persons who would like a copy of the document were urged to contact this office.

A meeting was held on January 18 among Hank Fischer, Defenders of Wildlife; Craig Knowles, UM Ph.D. candidate; and BLM personnel. The meeting concerned the panel discussion of December 12, 1981.

BLM personnel were asked to discuss prairie dog management and the forthcoming document at:

Square Butte Grazing Association Meeting
February 1, 1982, 1:00 p.m.

Malta Kiwanis Club
February 9, 1982, 6:45 p.m.

South Phillips Cooperative State Grazing Association
March 12, 1982, 1:30 p.m.

A letter was sent to all panel members on March 17, 1982, which included the notes from the panel meeting and the outline of the forthcoming document.

A mailing list was started as a result of the January 18 news release. Also a letter dated March 19, 1982, was sent to all permittees asking whether they would like a copy of the document.

A public meeting will be scheduled at the First Creek Hall to solicit comments on this document.

LIST OF PREPARERS

This environmental assessment (EA) was prepared by the specialists from the BLM's Phillips RA Office with assistance from the Lewistown District Office (LDO) and the Havre Resource Area Soil Scientist. Disciplines and skills used to develop this EA were: climate, soils, watershed, vegetation, wildlife, recreation, cultural resources, sociology, economics, graphics, editing, printing, public affairs and typing.

The following individuals were involved in preparing this EA:

Team Leader	John Grensten, PRA
Team Coordinator	Tad Day, LDO
Soils and Watershed	Dan Tippy, HRA
Vegetation and Livestock Production	Larry Rau, PRA
Wildlife	Fritz Prellwitz, PRA
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MONTANA BLM PRAIRIE DOG POLICY AS OF APRIL, 1980

The management of prairie dog habitats on public lands in Montana, administered by the Bureau of Land Management (BLM), is a controversial issue because of the conflicting interests of a concerned public. More than 100 public comments were received in response to a draft Habitat Management Plan for the Prairie Dog Ecosystem distributed by BLM. This document was widely reviewed by citizens, private organizations and public agencies throughout the United States. Comments ranged from those favoring total preservation of prairie dogs to those advocating large scale population reductions.

BLM policy for managing prairie dog habitat was formulated after careful review of all public comments received, and consideration of applicable Federal and state laws and regulations. This policy is intended to be responsive to those comments and to BLM's legal mandates.

The Bureau recognizes the authority of the State of Montana for management of resident wildlife species, including prairie dogs. Any population management on public land will be accomplished in cooperation with the appropriate state agencies.

All prairie dog towns on public land will be inventoried and examined for presence of associated wildlife species including threatened or endangered species. The Bureau will cooperate where feasible with other agencies, universities and private groups to accomplish inventories and ecological studies.

The BLM recognizes the prairie dog ecosystem as an integral part of the prairie environment and its perpetuation should be consistent with multiple use management of public lands. The following policies shall apply in this regard:

1. Selected prairie dog towns will be maintained at a determined level to support a viable population of prairie dogs for public use. Public uses include nature study, scientific research, photography, educational study and sport hunting.

2. Selected prairie dog towns will be maintained at a determined level to provide habitats for associated wildlife species. Prairie dog towns are used by more than 20 wildlife species of which 6 have been designated as species of special concern by Montana Department of Fish, Wildlife and Parks.

3. Selected prairie dog towns will be maintained at a determined level to provide habitat for species designated as threatened or endangered by Federal and state laws. Currently, the black-footed ferret is the only endangered species known to be associated with prairie dog towns, which are primary habitat for this mammal. Prairie dog towns on public lands will be maintained to support at least one wild self-sustaining population of ferrets in Montana as prescribed by the Fish and Wildlife Service's Black-Footed Ferret Recovery Plan.

Although some prairie dog towns may be managed primarily for wildlife and recreational values, others not selected for these purposes will be subject to multiple use management. Where prairie dogs are reported to damage public and adjoining private rangelands the following policy shall apply:

1. Where it has been documented through field investigation that prairie dogs cause unacceptable damage to public resources, such as soil loss or destruction of vegetation, a variety of land treatments including prairie dog control will be considered for rehabilitating rangelands. Other treatments may include such practices as watershed improvements and manipulation of livestock grazing. Prairie dog control will be carried out by appropriate state and Federal agencies using techniques recommended by them and approved by BLM. Sport hunting of prairie dogs, as permitted under state law, is recognized as a legitimate recreational use of public lands; hunters may be directed to towns approved for control.

2. Before control plans for any prairie dog towns can be approved by BLM, each town must be intensively inventoried for threatened and endangered species. If such species are present, any proposal for control must clearly demonstrate that prairie dog control will not jeopardize the continued existence of the species or destroy or adversely modify its habitat.

3. All approved control plans will be fully coordinated with appropriate state and Federal agencies.

The BLM recognizes implementing this policy will require close coordination with Federal and state agencies and private landowners. These include, but are not limited to, Montana Department of Fish, Wildlife and Parks, Montana Department of Livestock, United States Fish and Wildlife Service, livestock operators on public lands, and private landowners whose property adjoins public land.

Source: BLM, 1980.

IN REPLY REFER TO:
9220 (931)

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
222 North 32nd Street
P.O. Box 30157
Billings, Montana 59107

JUN 4 1981

Instruction Memorandum No. MT-81-217
Expires 09/30/82

To: District Managers

From: State Director

Subject: Prairie Dog Damage Assessment Draft

Enclosed is the final draft for assessment of reported prairie dog damage on public lands. The text reflects comments received in response to Instruction Memorandum MT-060-81-47. The procedures will be finalized in 1982 after having been field tested this summer. Appropriate modifications will be made as necessary.

Additional questions and constructive comments should be forwarded to Jeff Shryer, Lewistown District Office.

Enclosure

Distribution
Director (240) 2
SCD (D-559A) 3
SD's Staff 1
RAHs 1

METHODS FOR EVALUATING REPORTED PRAIRIE DOG DAMAGE

Rangeland damages associated with prairie dog colonies on public lands will be investigated pursuant to BLM-Montana State Office Prairie Dog Habitat Management Policy Statement of April, 1980. Field examinations will determine the nature and extent of reported damages and identify management actions necessary for their expeditious recovery. Investigative procedures are prescribed that measure existing resource conditions, and generate recommendations for rehabilitation. Such examinations are required prior to any rangeland treatment or management of prairie dog colonies and will provide the basis for related environmental assessments.

Three representative soils and range sites associated with each subject colony will be measured and evaluated: inside the colony, adjacent to the colony perimeter in comparable soils, and at a comparison area. Comparison areas are areas under grazing management with identical soils but have optimum range conditions (high good-excellent) based on the production potential of the soil.

The purpose of sampling is to document the soils series and range conditions inside the colony where conditions may be influenced by both prairie dogs and livestock; beyond the colony perimeter where conditions are largely influenced by livestock, and at a comparison area where optimum range conditions are maintained with grazing management. The range condition of the comparison area will be the management model by which the trend of the subject colony is evaluated and needed management treatments are prescribed.

Range condition elements to be evaluated at each of the three sites are:

1. Vegetation canopy coverage determined from canopy coverage (Daubenmire) transects. Sampling elements will also include plant litter, bare-ground, and rock content.

2. Range condition and trend of the affected allotments(s).

3. Forage production and trend.

4. Utilization based on the key forage plant method or from Daubenmire transects. Daubenmire transects provide for recording plant utilization.

5. Identification, condition, trend, and value of any significant existing wildlife habitat in the subject area.

6. Erosion, water infiltration, and runoff. Watershed condition and trend will be projected from soil characteristics and vegetation cover derived from the canopy coverage transects. Erosion assessment will be conducted pursuant to MSO Instruction Memorandum No. MT-81-171. The soil series at each canopy coverage plot will be identified to define the soil composition of the site.

A literature review will be conducted prior to the field examination to obtain all available data pertinent to the subject area. It is anticipated planning system documents will identify any important wildlife, watershed, and range issues. SVIM comparison areas located close to the subject colony(ies) may be used if their soils are identical.

Comparison areas should be in at least a high good condition. Data from the comparison area can be applied to all applicable colonies with the same soils. It is unnecessary to establish individual comparison areas for colonies having identical soil series. A soil scientist should be involved in the initial examinations to identify the soils associated with each site and their responses to management.

Summaries will include an evaluation of the reported damages and any unacceptable conditions verified from the field examination. Probable causes of any rangeland deterioration will also be discussed. Recommendations for corrective management will consider grazing management practices, watershed treatments, prairie dog population management, wildlife habitat management needs and resource trade-offs.

Recommendations will be concerned with the total resource picture. Treatments will be directed toward rehabilitating unacceptable range conditions both inside and adjacent to the colony and tailored to the soils present.

Examination results and initial recommendations should be coordinated with the operator(s), Grazing Advisory Board, grazing district, Montana Department of Fish, Wildlife and Parks, and any other pertinent interested parties. The resulting input should define the actions proposed for management in the environmental assessment.

IN REPLY REFER TO:

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
222 North 32nd Street
P.O. Box 30157
Billings, Montana 59107

6840 (931)

APR 17 1981

Instruction Memorandum No. MT-81-163
Expires: 9/30/82

To: District Managers

From: State Director

Subject: Inventory Procedures for Endangered and Sensitive Wildlife Species Associated With Prairie Dog Colonies

Increased public demand for prairie dog management on public lands has generated a need to identify wildlife resources associated with prairie dog colonies.

Three vertebrates closely associated with prairie dog colonies in Montana require special management attention. These species are the black footed ferret, Mustela nigripes, listed as an endangered mammal pursuant to the Endangered Species Act of 1973; the mountain plover, Charadrius montana, and the burrowing owl, Athene cunicularia. The latter two are birds listed as vertebrate species of special concern by the Montana Department of Fish Wildlife and Parks. Inventory methods are prescribed to ensure that their essential habitat areas can be identified for any proposed action that may impact prairie dog colonies on BLM-administered land. The prescribed inventories may also be used for general surveys associated with planning efforts. Procedures are subject to modifications as new information becomes available.

Inventories will be applied in two categories according to the type of proposed action: (1) actions that would eliminate or impact a majority of active burrows (i.e., prairie dog control, contour furrowing, etc.) will require an inventory of the entire colony, (2) linear type projects (i.e., roadways, pipelines, transmission lines, etc.) and point source projects (i.e., stock ponds, drilling sites, etc.) will require an inventory of that portion of each colony that lies within one-eighth mile (220 yards) of the project site perimeter. If ferret sign is observed, an intensive nighttime search, described on page 3, will be required.

Inventory for the ferret is mandatory and shall be conducted during the prescribed time frames. Inventories for the burrowing owl and mountain plover are recommended but shall not be mandatory until these species are officially listed as sensitive by the State Director pursuant to Bureau policy or by designation of the Secretary of the Interior.

Prairie dog colonies will be examined separately for the ferret and the two birds except between July 15 and August 15, when their prescribed inventory time frames overlap.

Prairie dog colonies may also be locally important as feeding areas for any golden eagles, Aquila chrysaetos and ferruginous hawks, Buteo regalis, nesting in their vicinity. These birds are also species of special concern designated by the Montana Department of Fish, Wildlife and Parks. Both may feed heavily on prairie dogs if they are readily available. Prairie dog colonies known to be in close proximity to the active nests of these birds may also require special management attention.

Although these procedures pertain only to certain species, other wildlife species associated with prairie dog colonies should be inventoried and given appropriate management consideration.

Prior to starting surveys, all participants should receive training from experienced wildlife staff to familiarize them with the physical characteristics, habitats and signs of each species of inventory concern. If experienced staff is not available, contact MSO 931.

Prefield Examination

The following procedures will be completed before conducting field examinations:

A. Identify the area proposed for survey and delineate on a resource map.

B. Locate known prairie dog colonies from existing sources, including Bureau planning documents (URA's, MFP's, AMP's, HMP's, EA's and EIS's), aerial photos, inquiries to knowledgeable individuals and contacts to state and federal agencies.

C. Record all identified colonies on reference maps and organize them into logical inventory units for systematic field examination.

D. Become familiar with the physical characteristics, habitat requirements, behavioral traits and sign of inventory species.

Field Examinations

E. Examine the proposed survey area to identify any unrecorded towns. Search for inventory species and their sign while systematically walking, riding or driving through each prairie dog colony.

Survey flags can be used to delineate the area of examination and to mark the sites where sign is located. The survey is completed when the observer is satisfied a diligent search has been made. A summary of each survey will be recorded on the enclosed form. Photographs should be taken of all significant evidence and included with the form. Unless ferret sign is observed, only one field examination per colony would be necessary for a "no occupancy" determination of ferrett presence. Incidental wildlife observations should also be reported. The card, when completed, signed and dated by the observer(s) will document that the inventory was satisfactorily completed and conducted to acceptable standards. The survey will be valid for a period of 12 calendar months following its completion date. A new survey will be required for actions effective after this time frame. Multiyear projects will require annual ferret surveys to be conducted within 1/8 mile of that portion of the project to be impacted that year. Followup prairie dog control programs will require a resurvey of the remaining active portion of the colony.

The survey techniques for each species of inventory concern are described below. Additional information can be presented during training sessions.

1. Black-footed Ferret

Inventory for the black-footed ferret involves two levels of examination. The first level is an extensive daytime survey of each prairie dog colony to determine the existence of any evidence of ferret activity. Optimum period for ferret inventory is between July 15 and September 1 when the family group extends its activities above ground. Inventories should not be conducted before July 15, but may be conducted until September 30. Start surveys at dawn by scanning the colonies with binoculars and spotting scopes to search for ferrets and fresh diggings. Conduct scanning before entering the colony. Also, look for excited prairie dog behavior when the prairie dogs become active.

At attempt should be made to check every prairie dog burrow for the following evidence of ferret activity:

A. Dirt pulled away from the burrow entrance and strung out or piled. Trenches or stringers of soil 3-5 inches wide, 2-3 inches deep and greater than one foot long, often with a groove in the center. It may exude a mild skunk odor if recently excavated. Dirt pulled away from the burrow is commonly much wider than 3-5 inches and sometimes fan shaped (12-15 inches wide at extremity from the burrow). Also, sometimes the soil is pulled out in a steep incline from the burrow with the outward extremity 10-12 inches deep.

B. Prairie dog burrows plugged with soil, especially where several plugs exist within a relatively small area.

C. Skeletal material: (1) prairie dog skulls exhibiting small tooth marks on posterior portion of skull, (2) skulls of the black-footed ferret.

D. Fecal material from mustelid-type animals. Usually, scat is marked by segmentation and twisting when composed of hair and varies from dark brown to black in color, approximately ¼ inch in diameter and usually 1½-3 inches long.

E. Prairie dog behavior: upright posture and alarm chatter in response to predators. Prairie dogs sometimes harass ferrets by chasing them through the dog town: look for such activity.

Each burrow will be counted, using a hand counter. All locations exhibiting ferret sign will be prominently marked to aid in defining any nucleus area of activity. The assessment of possible ferret occupation would be based on the cumulative product of all evidence obtained rather than an independent evaluation of each component.

The second level of inventory consists of an intensive nighttime search to locate ferrets. This effort would be applied to the entire town where evidence from the extensive inventory indicated ferret occupation. If no evidence was observed, no further ferret surveys would be warranted for 12 calendar months.

In areas where possible ferret sign is found, a minimum of three night surveys will be conducted, using the following procedures:

1. Surveys will be conducted during three nights with good weather conditions; wind velocity less than 10 m.p.h. and no rain.

2. Night surveys will be conducted as soon as possible after the ferret sign is observed and completed within two weeks of the observation date.

3. Access routes should be located and marked during the daytime.

4. Advance notice of the night survey dates will be given to the local game warden, sheriff's department and applicable landowners.

5. Survey the colony with binoculars at dusk to search for any abnormal prairie dog behavior, as described in 1E. This can be done from the vehicle.

6. A minimum 100,000 candle power spotlight will be used to search for ferrets at night. At dark, park where the area of observed sign is in full view and sweep the spotlight over the entire area every ten minutes for approximately one hour. Then drive through the remainder of the town, sweeping the light continuously. After the entire colony has been scanned

in this manner, return to the parking spot or spots and repeat the procedure. Continue until midnight and then begin again three hours before sunrise and continue through dawn.

Watch for ferrets above ground and particularly for their eyeshine, which usually reflects as green but may also appear as other colors, depending on the angle of reflection. If eyeshine is observed, attempt to identify the animal with binoculars. Next, rapidly move near the animal and attempt to make a positive identification. A camera with flash should be available to take photos for documentation. If the animal descends a burrow, wait for it to reappear. Blowing a predator call may help bring it to the surface if it hasn't reappeared within an hour.

7. After sunrise, examine the burrows in the vicinity of the ferret sign to search for fresh sign and scan the colony again for ferrets.

8. Montana Department of Fish, Wildlife and Parks has lead responsibility for implementing the Black-footed Ferret Recovery Plan in Montana. Notification of any confirmed ferret observations will be made to this agency and consultation with the U.S. Fish and Wildlife Service will be initiated for any proposed action anticipated to impact the prairie dog colony.

2. Burrowing Owl

Burrowing owls arrive in Montana in early spring. Breeding pairs select a single burrow site for nesting and rearing young. This is commonly a prairie dog burrow modified by the adult birds.

Both parents and young occupy the burrow until late July. Usually only one pair of owls nests at a single prairie dog colony.

A literature search to locate known nest sites would be completed prior to conducting field work. During field examinations, the entire prairie dog colony is scanned with binoculars to locate both young and adult birds. Each prairie dog burrow will be examined for owl nesting activity. Adult birds are generally observed when flushed near the natal burrow. Between the second week of June through July, juveniles conspicuously cluster at the entrance of the natal burrow and wait for the parents to bring them food. Searching for young birds clustered together at a prairie dog mound during this time is the best method to locate natal burrows. By August, the family group begins to disband and the young start to forage for themselves.

Adults may be seen foraging for insects and small rodents throughout the breeding season. They often emit a variety of vocalizations when disturbed. Burrowing owls are most active in the morning until approximately 10:00 a.m. and in the late afternoon between 4:00 and 6:00 p.m.

Natal burrows can usually be recognized by the accumulation of feathers, pellets, excrement and prey remnants scattered at the entrance, presenting a "chicken coop" appearance. However, some may contain little or no sign, especially before the birds moult, and their identification can only be confirmed by observation of the clustered young. Nonbreeding individual adults are occasionally observed and should not be mistaken for breeding birds. The number of young and adult birds observed will be recorded and each natal burrow will be identified on a reference map.

3. Mountain Plover

Mountain plovers generally occupy prairie dog colonies between the first of April through mid-August. They nest on the bare ground of sparsely vegetated prairie dog colonies occupying level terrain. Knowles, et al. 1980, report that most prairie dog colonies occupied by plovers at the CMR Wildlife Refuge had less than a 12 percent slope, were associated with upland areas and had been heavily grazed by livestock. Larger prairie dog towns usually contained more than one pair of plovers.

Examinations for mountain plovers will be similar to those described for burrowing owls. However, mountain plover nests are difficult to locate and observers will only need to search the prairie dog colony for breeding pairs and young birds to confirm nesting activity. It is not necessary to examine individual prairie dog burrows. Mountain plovers are easily identified. They can be closely approached and usually run in front of the observer before flushing. Broods are most frequently observed during June and July. The number of young and adult birds observed at each occupied prairie dog town will be recorded.

Enclosure

Distribution
Director (855) 2
Director (D-599A) 3
SD's Staff 1
RAHs 1

APPENDIX 4: ESTIMATED PRAIRIE DOG ACREAGE OVER THE FIVE-YEAR CONTROL PROGRAM FOR ALTERNATIVE A

Year	March 1 Acres	September 1 Acres[1/]	Acres Controlled[2/]	Acres Follow-up[3/]
1982	8,274	10,508	3,250	325
1983	7,258	9,218	3,250	325
1984	5,968	7,579	3,250	325
1985	4,329	5,498	3,250	325
1986	2,248	2,855	2,855	286
1987	0			

1/ The September 1 acreage represents a 27% per year expansion rate (Howard Teigan 1980, Personal Communication, Fish and Wildlife Service on the Buffalo Gap National Grasslands, South Dakota).

2/ The control is assumed to be 90% effective.

3/ The follow-up is the remaining 10% of the control acres for that year.

APPENDIX 5: ESTIMATED PRAIRIE DOG ACREAGE OVER THE 15 YEARS OF CONTROL AND MAINTENANCE IN ALTERNATIVE B

Year	March 1 Acres	September 1 Acres[1/]	Acres Controlled[2/]	Acres Follow-up[3/]
1982	8,274	10,508	3,100	308
1983	7,408	9,408	3,100	308
1984	6,308	8,011	3,100	308
1985	4,911	6,237	3,100	308
1986	3,137	3,984	3,084	306
1987	900	1,143	243	24
1988	900	1,143	243	24
1989	900	1,143	243	24
1990	900	1,143	243	24
1991	900	1,143	243	24
1992	900	1,143	243	24
1993	900	1,143	243	24
1994	900	1,143	243	24
1995	900	1,143	243	24
1996	900	1,143	243	24
1997	900	1,143	243	24

1/ The September 1 acreage represents a 27% per year expansion rate (Howard Teigan 1980, Personal Communication, Fish and Wildlife Service on the Buffalo Gap National Grasslands, South Dakota).

2/ The control is assumed to be 90% effective.

3/ The follow-up is the remaining 10% of the control acres for that year.

APPENDIX 6: ESTIMATED PRAIRIE DOG ACREAGE OVER THE 15 YEARS OF CONTROL AND MAINTENANCE IN ALTERNATIVE C

Year	March 1 Acres	September 1 Acres[1/]	Acres Controlled[2/]	Acres Follow-up[3/]
1982	8,274	10,508	2,900	290
1983	7,608	9,662	2,900	290
1984	6,762	8,588	2,900	290
1985	5,688	7,224	2,900	290
1986	4,324	5,491	2,850	285
1987	2,641	3,354	713	71
1988	2,641	3,354	713	71
1989	2,641	3,354	713	71
1990	2,641	3,354	713	71
1991	2,641	3,354	713	71
1992	2,641	3,354	713	71
1993	2,641	3,354	713	71
1994	2,641	3,354	713	71
1995	2,641	3,354	713	71
1996	2,641	3,354	713	71
1997	2,641	3,354	713	71

1/ The September 1 acreage represents a 27% per year expansion rate (Howard Teigan 1980, Personal Communication, Fish and Wildlife Service on the Buffalo Gap National Grasslands, South Dakota).

2/ The control is assumed to be 90% effective.

3/ The follow-up is the remaining 10% of the control acres for that year.

APPENDIX 7: ESTIMATED PRAIRIE DOG ACREAGE OVER THE 15-YEAR PROGRAM FOR ALTERNATIVE D

Year	March 1 Acres	September 1 Acres[1/]	Acres Controlled	Acres Follow-up
1982	8,274	10,508	0	0
1983	10,508	13,345	0	0
1984	13,345	16,948	0	0
1985	16,948	21,524	0	0
1986	21,524	27,336	0	0
1987	27,336	34,717	0	0
1988	34,717	44,090	0	0
1989	44,090	55,995	0	0
1990	55,995	71,113	0	0
1991	71,113	90,314	0	0
1992	90,314	114,698	0	0
1993	114,698	145,667	0	0
1994	145,667	184,997	0	0
1995	184,997	234,946	0	0
1996	234,946	298,382	0	0
1997	298,382		0	0

1/ The September 1 acreage represents a 27% per year expansion rate (Howard Teigan 1980, Personal Communication, Fish and Wildlife Service on the Buffalo Gap National Grasslands, South Dakota).

APPENDIX 8: VEGETATION AND RANGE MANAGEMENT CHARACTERISTICS OF THE NINE SOIL SUBGROUPS*

Soil Subgroup and Soil Names	Vegetation Type	Key Species	Increasers	Response to Grazing Management	Suitability for Mechanical Treatments	Other Suitable Land Treatments	Other
1. Loamy glacial till upland plains; series are Bearpaw, Dooley, Hillon, Joplin, Kevin, Phillips, Scobey, Sunburst, Telstad, Vida, Williams, Zahl, Zahill	Grassland (short and midgrasses)	Western and thickspike wheatgrasses	Needleandthread; blue grama, clubmoss, fringed sagewort	Slow, due to clubmoss and blue grama	Well suited on slopes less than 12%	Fertilization, prescribed burning; recommended on crested wheatgrass	Local areas have 5 to 25% surface stones which influence suitability for mechanical treatments
2. Claypan and dense clay glacial till uplands; series are Elloam, Tealette, Theony	Grassland-sagebrush; (short and midgrasses)	Western and thickspike wheatgrasses	Blue grama, clubmoss, fringed sagewort, cactus, big sagebrush	Very slow due to claypan in subsurface; dense clay, clubmoss and blue grama	Well suited on slopes less than 8%. Depth of treatment should be 6-10"	Same as above	Local areas may have more than 25% of the surface area covered with stones
3. Clayey acid shale uplands; series are Dilts, Julin, Teigen	Grassland-sagebrush-juniper (midgrasses predominate)	Prairie sandreed, little bluestem, western and thickspike wheatgrasses	Sagebrush, creeping juniper	Responds quickly due to granular surface and high shrink-swell which provides seedbed	Not suited	--	Severely erosive
4. Calcareous or bentonitic shale uplands; series are Abor, Bascovy, Dimyaw, Lisam, Norbert, Neldore, Thebo, Weingart, Yawdim	Grassland-sagebrush (midgrasses predominate)	Western and thickspike wheatgrasses, green needlegrass	Big sagebrush	Same as above	Not suited	--	--
5. Loamy sedimentary uplands; series are Cabba, Cabbart, Cambert, Dast, Delpoint, Doney, Ernem, Lonna, Marmarth, Reeder, Rentsac, Riedel, Twilight	Grassland (short and midgrasses)	Western and thickspike wheatgrasses, bluebunch wheatgrass	Blue grama, clubmoss, cactus, fringed sagewort	Slow due to clubmoss and blue grama, except on Riedel, Twilight and Dast soils	Cambert, Delpoint, Doney, Lonna, Marmarth and Reeder soils are well suited on slopes less than 8%	Fertilization, prescribed burning (recommended on crested wheatgrass)	--
9. Medium textured soils on terraces, footslopes and fans; series are Attewan, Benz, Bitton, Brockway, Evanston, Farland, Farnuf, Floweree, Judith, Kremlin, Lambeth, Macar, Martinsdale, Redvale, Shawmut, Straw, Turner, Vanstel, Work and Yamac	Grassland and grassland sagebrush	Western and thickspike wheatgrasses	Needleandthread, blue grama, clubmoss, fringed sagewort, cactus	Slow, due to clubmoss and blue grama, and location near floodplains	Well suited on slopes less than 8% (except Bitton, which is too stony)	Fertilization, prescribed burning (recommended on crested wheatgrass)	Benz soil is strongly alkaline with greasewood and saltgrass as part of the vegetation
10. Fine textured soils on terraces, footslopes and fans; series are Acel, Cherry, Ethridge, Grail, Kobar, Lawther, Linnet, Lothair, Marias, Marvan, Pendroy, Richey, Savage, Shaak	Grassland-sagebrush (midgrasses predominate)	Western and thickspike wheatgrasses, green needlegrass	Big sagebrush	Lawther, Marias, Marvan and Pendroy respond rapidly due to granular surface and high shrink-swell which provides a seedbed, other series are slow due to clubmoss and blue grama	All series except Lawther, Marias, Marvan and Pendroy are well suited on slopes less than 8%	Sagebrush control	--
11. Claypan and dense clay soils on terraces, footslopes and fans; series are Creed, Gerdrum, Tealette	Grassland-sagebrush (short and midgrasses)	Western and thickspike wheatgrasses	Big sagebrush, blue grama, clubmoss, cactus, wooly Indianwheat	Very slow due to claypans, dense clay, clubmoss and blue grama	Well suited on slopes up to 8%; depth of treatment should be 6-10"	--	--
13. Very slowly permeable soils of terraces and fans, series are Vanda, Veada	Grassland-sagebrush	Western and thickspike wheatgrasses, green needlegrass, Nuttall saltbush	Big sagebrush, cactus, sandberg bluegrass, foxtail barley	Extremely slow	Not recommended due to economics and erosion hazards	--	--

* Taken from Prairie Potholes EIS, Appendix 3.2.

BENEFIT — COST ANALYSIS
DATA INPUT

Name of Allotment	Allot. #	D.O. Code	R.A. Code	P.U. Code

Allotment Base Data	Unit Values	Present Situation	Without AMP	With AMP
Percent change — Build-up period			(+)(-) ___% ___Yrs.	(+)(-) ___% ___Yrs.
AUMs				
Value of avoiding the loss of 1 AUM				
Value of gaining 1 AUM				
Cows (Number in breed herd)				
Calves				
% Calf crop, at weaning				
Net return per calf				
Calf weights				
Avg. calf price per lb.				
Hunter-Fisherman Days				
01 Mule deer				
02 White-tail deer				
03 Antelope				
04 Elk				
05 Bighorn sheep				
06 Upland game birds				
07 Geese				
08 Ducks				
09 Fishing (cold water)				
10 Fishing (warm water)				
11 Non-Hunter Visitor Days				

PROPOSED NEW CONSTRUCTION, OPERATION and MAINTENANCE COSTS

CODE	Type of Project	Initial Const. Cost (Per Unit)	Annual O/M Cost	Replacement Years	Proposed with AMP (units)			
					BLM		Rancher	
					Const.	O/M	Const.	O/M

STANDARD PROJECT CODES

1	Fence (mi.)	6	Stock Tank (ea.)	11	Plow and Seed (ac.)
2	Cattleguard (ea.)	7	Well (ea.)	12	Prescribed Burn (ac.)
3	Reservoir (ea.)	8	Catchment (ea.)	13	Type IV Crossing (ea.)
4	Spring (ea.)	9	Contour Scalping (ac.)	14	Fence removed (mi.)
5	Pipeline (ft.)	10	Sage Spray (ac.)	•	

Additional Implementation Costs		Value Per Day		BLM		Rancher
21	Supervision days					
22	Monitoring days					
23	Lvst. handling days					

*Additional types of projects and codes may be added if necessary. Or when initial construction costs are significantly different the same type of project, enter the same project and code, showing the differences in cost (for example):

Code			Code		
2	Cattleguard	$2,000	3	Reservoir	$3,500
2	Cattleguard	$5,000	3	Reservoir	$13,000

PROPOSED LONG COULEE ALLOTMENT MANAGEMENT PLAN
BENEFIT - COST ANALYSIS (METHODOLOGY ADDENDUM)

The Long Coulee AMP benefit-cost analysis was done according to procedures developed by the Department of the Interior and Bureau of Land Management in 1976. The analysis was based on projecting the cost and benefits with and without the proposed projects. (i.e., Allotment Management Plan). Projected costs and benefits were discounted to present worth. Present worth of benefits was divided by present worth of costs to calculate the B/C ratio.

Production Data

Units	Present Situation	Without AMP	Alternative A With AMP (15 year)*	Alternative B With AMP (3 yrs)*	Alternative B With AMP (15 yrs.)*
Annual AUM's	1,375	564	1,973	1,562	564
Percent calf crop	90	85	95	90	85
Calf weaning weights	450	400	475	450	400
Wildlife hunting days					
Deer	118	112	124	124	124
Antelope	56	49	56	56	56
Duck	48	48	64	64	64
Geese	3	3	13	13	13
Upland game birds	7	4	6	6	6
Prairie dogs	6	6	2	2	6

* Production factors are estimated to reach these points in the year specified.

Dollar Value Estimates

Livestock AUMs*:

Value of avoiding the loss of an AUM = $13.42
Value of gaining an AUM = $ 6.55

* Based on Economics and Statistics Service, USDA linear programming model of ranch budgets; Prairie Pothole Environmental Impact Statement Appendix.

Wildlife Hunting Values:

Wildlife Species	*Value per Hunter Day
Deer	$ 24
Antelope	41
Ducks	6
Geese	12
Upland game birds	6
Prairie dogs	40

* These values were determined by the Department of the Interior and BLM Washington Office, except for prairie dog sport shooting which was estimated by the Lewistown BLM Office.

Cost Data

Construction Costs:

TYPE OF PROJECT	COSTS	UNITS ALTERNATIVE A	ALTERNATIVE B
Reservoirs	$1,350/ea	5 each	5 each
Chisel plow	20 ac.	1,180 ac.	600 ac.
Seeding	10/ac.	1,180 ac.	600 ac.
Fencing	2,700/mi.	--	3.3 mi.
Poisoning	4.50/ac.	1,010 ac.	600 ac.

Operation and Maintenance Costs:

Unit	Annual Cost
Reservoirs	$60/each after 15 years
Fences	$20/mile after 15 years
Poisoning	$.45/acre after 2 years
Supervision, studies and handling livestock	$100/day for added 18 days

Discount Rate and Project Life

Discount Rate = 7-3/8 percent Water Resources Council published in Federal Register (45 FR 70 167) on October 22, 1980.

Based on a 50-year project life.

Benefit/Cost Analysis - Alternative A

Benefits	Present Worth
AUM Increase	$21,400*
AUM loss avoided	59,200
Calf crop percentage increase	12,600
Calf crop percentage loss avoided	12,600
Calf weaning weight increase	15,900
Calf weaning weight loss avoided	31,800
Hunting Days	
Deer increase and loss avoided	1,600
Antelope increase and loss avoided	1,600
Duck increase	500
Geese increase	700
Upland game birds net increase	100
Prairie dog loss	-2,100
Total	$155,900

* Present worth benefits for first 15 years calculated by multiplying the present worth of annuity increasing by 1 per year for 15 years (59.572) times the average annual increase in AUMs (1973 AUMs-1,375 AUMs = 598 ÷ 15 years = 40 AUMs) times value ($6.55) per AUM (59.572 x 40 x 6.55 - $15,600). Present worth of benefits for the 16th through 50th year calculated by subtracting present worth of 1 per year for 15 years from present worth of 1 per year for 50 years and multiplying the product by present worth of 1 for 15 years (13.173 - 8.896 = 4.277 x .344 = 1.47.) This factor is then multiplied by the increase in AUMs (598) times the value of an AUM ($6.55). (1.47 x 598 x $6.55 = $5,800.) $15,600 + $5,800 = $21,400.

Costs:

Investment	Unit	Present Worth
Reservoir	5/each	$ 6,750
Plowing	1,180 ac.	23,600
Seeding	1,180 ac.	11,800
Poisoning	1,010 ac.	4,550
Total		$46,700

Operation and Maintenance

Item	Present Worth
New reservoirs after 15 years	400
Maintain poisoning after 2 years	6,000
Supervision, studies and livestock movement	23,700
Total	$30,100

Total Cost: $46,700 + 30,100 = $76,800

Benefit/Cost Ratio: Alternative A

$155,900 ÷ $76,800 = 2.03:1

Net Benefits $155,900 - $76,800 = $79,100

Benefit/Cost Analysis - Alternative B

Benefits	Present Worth
AUM increase	$ 5,400
Hunting days	
Deer increase and loss avoided	1,600
Antelope increase and loss avoided	1,600
Duck increase	500
Geese increase	700
Upland game birds net increase	100
Prairie dog loss	-400
Total	$ 9,500

Costs:

Investment	Unit	Present Worth
Reservoir	5 each	$ 6,750
Plowing	1,180 ac.	23,600
Seeding	1,180 ac.	11,800
Fencing	3.3 miles	8,900
Poisoning	600 ac.	2,700
Total		$44,850

Operation and Maintenance

Item	Present Worth
New reservoirs after 15 years	400
Fence maintenance after 15 years	100
Maintain poisoning after 2 years	3,550
Supervision, studies and livestock movement	23,700
Total	$27,750

Total Cost: $44,850 + $27,750 = $72,600

Benefit/Cost Ratio: Alternative B

$9,500 ÷ 72,600 = 0.13:1

Net benefits $9,500 - $72,600 = - $63,100

Explanation

The district office B/C analysis arrived at a benefit cost ratio of 2.68:1 for alternative A and a ratio of -1.45:1 for alternative B. This analysis was reviewed by the State Office and the benefits and costs recalculated. The State Office analysis arrived at a B/C ratio of 2.03:1 for alternative A and a ratio of 0.13:1 for alternative B. The State Office ratio is lower for several reasons. One, a more current discount rate was used. Two, the benefits occurring because of increased herd size were not included in the State Office analysis because these are captured in the increased forage production. An error was made in calculating the ratio of benefits to costs in alternative B in the district study. Benefits should have been divided by cost to arrive at a less than one to one ratio and not a negative number.

IN REPLY REFER TO:

1114 (910)

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
222 North 32nd Street
P.O. Box 30157
Billings, Montana 59107

15 JAN 1982

Instruction Memorandum No. MT-82-98
Expires 9/30/83

To: District Managers

From: State Director

Subject: Volunteer Program

I was pleased recently to learn that the BLM has considerable authority to use volunteers. I have had extremely good experiences in the use of volunteers in our type of office and field work. The budget picture does not look good so it is time to "get our feet wet" in use of volunteers. I know some of you have already used volunteers, but possibly we have just scratched the surface. It has been my experience that the people who volunteer tend to be as dedicated (or even more so) as hired seasonals. They do take management time, but do contribute substantially to getting our work done. A side benefit beyond the work is that the BLM develops a cadre of citizens who understand and give strong support to BLM programs.

I would like us to take a few more steps into a program and have asked Edna Haverland to be the Statewide coordinator of the volunteer program. I suggest each District Manager designate someone on your staff to coordinate for your District. Let Edna know who that is.

Let's have a trial program in place by the summer of 1982 to give us more experience. A number of our recreation sites may be a good place to start. Examples are some of the more popular, such as the Missouri River, Holter Lake, Garnet, and others.

Such volunteers could be drawn from the ranks of the senior citizens, teachers, interested groups, students, service clubs, and so on. They could be a highly visible asset at low cost acting as campground hosts, interpreters, issuing permits, collecting minor fees, and other activities.

The authority for the BLM to utilize volunteers is currently in place, and in some cases, may have been used. Authority for volunteer programs is cited below:

1. Student Volunteer Service program, authorized under the Civil Service Reform Act of 1978 (5 U.S.C. 3111)

2. BLM Manual Section 1114, Volunteers. This has recently replaced the authority encompassed in the Organic Act Directive (OAD) 81-2 relating to Section 309(c) of FLPMA)

3. Student Conservation Association (Federal Property and Administrative Services Act of 1949 (41 U.S.C. 252(c)(5))

You should review the enclosed 1114 manual release and get some ideas together for your District on areas where volunteers can be utilized. Discuss these with Edna. Then we will see what needs to be done next. I will ask Edna to get in touch with you if she has not heard from you by the middle of February.

Mike Penfold

1 Enclosure
Encl. 1 - Section 1114

Distribution
Director (830) - 1 (w/o encl.)
SCD (D-559A) - 3 (w/o encl.)
SD's Staff - 1 (w/o encl.)
RAH - 1 (w/encl.)

1114 - VOLUNTEERS

.01 *Purpose.* This Manual Section provides overall policy guidance and general instructions for using volunteers to further BLM programs. Voluntary contributions of materials are not included nor are student volunteer service programs authorized by the *Civil Service Reform Act of 1978* (see FPM, Chapter 308) or cost reimbursable arrangements with non-profit institutions.

.02 *Objectives.* The objectives of using volunteers are to:

A. Enhance BLM programs by accepting voluntary, uncompensated personal services;

B. Involve members of the public in the work of the BLM and provide them an opportunity to serve their nation;

C. Provide the public with an opportunity to contribute to the preservation, conservation, and development of the resources of the public lands;

D. Support affirmative action programs, through a career awareness approach, to assure that ethnic and racial minorities, women, the economically disadvantaged, and the handicapped have an opportunity to be exposed to occupations available within the Government;

E. Encourage interest in new or developing occupations and professions and provide opportunities for students and other young people to become involved in early career exploration as a basis for making realistic decisions regarding their future careers;

F. Provide exposure to the work environment as a means of encouraging students and other young people to develop work ethics and to acquaint them with the mission of the BLM.

.03 *Authority.*

A. *Federal Land Policy and Management Act of 1976* (43 U.S.C. 1737).

B. *Federal Tort Claims Act* (28 U.S.C. 2671-2680).

C. Provisions of the *United States Code* which authorize workers' compensation (5 U.S.C. 8101).

.04 *Responsibility.*

A. *Deputy Director, Management Services,* through the Assistant Director, Technical Services, develops policy and coordinates and assembles information, as necessary, to be used for reports to Congress, budget requests, etc.

B. *State Directors,* through their Volunteer Program Coordinators[1] coordinate projects and reports and respond to Washington Office and District Manager requests for information.

C. *Division Chiefs and Field Office Managers* are authorized to approve volunteer agreements and are responsible for ensuring compliance with directives regarding volunteers.

D. *The Project Leader Or Official in Charge of the Activity:*

1. Directs or oversees the work of the volunteer, provides any necessary instructions and guidance, and ensures that the volunteer is not involved in potentially hazardous work for which he/she is not appropriately qualified; and

2. Reports all accidents, injuries, and property damage to the appropriate officials (see BLM Manual Section 1112).

.05 *Definitions.*

Project Leader: A BLM employee who is assigned to supervise and oversee a volunteer, a group of volunteers, or a volunteer project.

Volunteer: Anyone who voluntarily and without compensation or reimbursement provides personal services to the BLM within the limits of a volunteer agreement.

.06 *Policy.* It is the policy of the BLM to encourage and accept volunteer services wherever BLM programs, services, or operations would be enhanced or improved by their use.

[1]Note that this may be assigned as an additional duty.

.1 Assignment of Volunteers.

.11 Acceptable Volunteer Services. Volunteers are used to complement rather than displace career employees or impair authorized service contracts. The following are some examples of areas where using volunteers may be particularly appropriate:

A. *Recreation Operations.*

1. Performing visitor services; creating photography, art, and design; conducting lectures; leading hikes; serving as campground hosts; issuing permits and collecting minor fee amounts (when properly authorized);

2. Providing interpretation and information, interpretive assistance, living history demonstrations, museum assistance, or writing interpretive materials.

B. *Resource Management.* Resource management assistance including projects in the biological and/or physical sciences, archaeological surveys, biological and geological inventories and surveys, collection of field data, environmental monitoring, and protection projects.

C. *Construction and Maintenance:* Physical improvements, such as maintenance or construction of recreation facilities or trails, range improvements, wildlife watering devices, nesting platforms, or stream clearance.

D. *Administration.*

1. Management and administrative support activities, such as data collection, review, and consolidation; special studies; reception; library work, and clerical assistance.

2. Assistance to BLM employees (this permits the volunteer to gain experience and familiarity with specialized professional or scientific equipment and procedures).

.12 Prohibited Volunteer Services.

A. *Law Enforcement.* Volunteers must not be used in direct regulatory or law enforcement activities. Volunteers must not carry firearms or issue citations.

B. *Hazardous Work.*

1. Volunteers must not be used in those activities which, for Federal pay purposes, are considered hazardous activities, such as low-level flying, firefighting, and other similar work. The servicing personnel office may be contacted for information on which activities are considered hazardous duty. (See BLM Manual Section 1400-550 and FPM Supplement 990-2, Book 550, Appendix A.)

2. Volunteers may operate heavy equipment or work on other potentially hazardous equipment or work projects if the supervisor is satisfied that the volunteer is fully qualified to do so. Because of the wide range of possible work situations and volunteers, this determination must be left to the judgment of the project leader/supervisor. However, if there is any doubt of an individual's capability or qualifications for a particular task, the volunteer must not be assigned to it.

C. *Search or Rescue.* Volunteers are not authorized to participate in searches or rescues on behalf of the BLM. They may participate as volunteers for local authorities.

D. *Policy Making.* Volunteers must not be assigned to policy making positions.

E. *Displacing Employees.* Volunteers must not be used to displace employees.

.2 Project Planning and Funding. Volunteer projects requiring expenditures for materials, equipment, or employee work months must be included in the Annual Work Plan of the benefiting program. Projects which require recruiting assistance must be submitted to the State Office Volunteer Programs Coordinator with the AWP. No reimbursement of individual volunteer expenses is authorized.

.3 Volunteer Eligibility and Status.

.31 Age. Volunteer service must comply with Federal and State laws and standards on using the services of minors; if questions arise about the application of labor laws, the servicing personnel office or local State employment service office should be contacted for information.

.32 Qualifications. Volunteers must be appropriately qualified through training or experience before being assigned to any potentially hazardous work. Volunteers must be physically able to carry out the work which they are assigned. Many types of work may be suitable for handicapped volunteers. Volunteers may be asked about any physical limitations related to the work to be done.

.33 Status. Conduct of volunteers while working in a volunteer status is governed by Department of the Interior regulations governing responsibilities and conduct, available from the servicing personnel officer. Volunteers participating in this program are not considered Federal employees for any purpose other than:

A. *Tort Claims.* The Federal Tort Claims provisions are published in 28 U.S.C., 2671 through 2680. Claims arising as a result of volunteer participation should be referred to the State tort claims officer. [2]

B. *Workers' Compensation.* Provisions for compensation for injuries sustained while performing work assignments is found in Title 5 U.S.C., Chapter 81. Any claims related to injuries should be referred to the servicing personnel officer. [2]

.34 Eligibility for Participation. Volunteers are accepted without regard to color, national origin, race, religion, age, sex, or other non-merit factors. They are not required to be U.S. citizens. BLM employees are not authorized to volunteer their services. BLM employees' family members may volunteer; however, their volunteer agreements must be approved by the next higher authority than the related employee.

.4 Documentation.

.41 Volunteer Agreements. The agreements outlined below are limited to one year in duration but may be renewed.

A. *Individual Volunteers.* Individual volunteer agreements must contain the following key items:

1. Full name, telephone number (with area code), and address (with zip code) of the volunteer;

2. Full name, telephone number (with area code), and address (with zip code) of next of kin or other person to be notified in case of injury or accident;

3. A description of the work to be performed with the dates on which or within which it will be performed. This section establishes the parameters of the volunteer's status for tort claims and workers' compensation;

4. The following statements which the volunteer must sign and date:

a. I understand that I will not be compensated for the above described work;

b. I understand that this service will not confer on me the status of a Federal employee except for purposes of the Federal Tort Claims Act which provides protection for me from liability incurred while acting within the scope of this agreement and the provisions of workers' compensation laws which provide compensation for injuries I might incur while serving as a volunteer within the scope of this agreement;

c. I understand that either the Bureau of Land Management or I may cancel this agreement at any time by notifying the other party in writing;

d. I am at least 18 years of age (if the volunteer is less than 18, see 5. below);

e. I hereby volunteer my services as described above to assist the Bureau of Land Management in its authorized work.

5. Signature and address of the volunteer's parent or guardian (if the volunteer is under 18 years of age) and the date signed;

6. Any other pertinent remarks;

7. A statement of acceptance on behalf of the BLM including the name, address, and telephone number of the project leader or supervisor;

8. Signature and title of the authorized officer (see .04C) making the acceptance along with the date signed; and

9. Agreement terminated by ..... (signature) on ..... (date).

[2] Volunteers are covered by these authorities only while they are performing within the scope of their agreements.

.5 Training.

.51 Orientation. Supervisors must ensure that each volunteer is given an orientation on BLM history, programs, objectives, environmental quality, job safety, and conduct while serving as a volunteer. Orientation may be less comprehensive, or waived, for groups of volunteers when the service is through a group volunteer agreement under the supervision of an experienced leader and, in the judgment of the responsible Bureau official, an orientation is not needed or would be impractical.

A. *Specific Orientation Items.* The project leader or supervisor:

1. Advises the volunteers that conduct while working in a volunteer status is governed by 370 DM 735, "Regulations Governing Responsibilities and Conduct of Employees," and makes a copy of the regulations available to the volunteers. The supervisor may obtain copies from the servicing personnel office;

2. Advises the volunteer that he/she will be considered a Federal employee, for tort claim (liability) and workers' compensation (injuries on the job) purposes only, while engaged in activities within the scope of the volunteer agreement;

3. Makes certain that the volunteer knows whom to contact in emergency situations as well as general emergency procedures to be followed should an emergency arise; and

4. Advises the volunteer that personal property is not covered under the lost property claim provisions of the United States Code.

.52 Other Training. Volunteers are expected to either bring skills with them or to be trained on the job. Volunteers may be invited to attend BLM training courses directly related to their volunteer assignment when their participation would not result in displacing employees or significant extra expenditures.

.6 Equipment and Facilities.

.61 BLM Equipment. Volunteers may be issued BLM equipment for their use on authorized projects (see .1 for restrictions).

.62 Government Vehicles. When necessary, volunteers may be issued a U.S. Government Vehicle Operator's Identification Card. The same procedures required in issuing a card to employees are followed.

.63 Facilities. Volunteers may be authorized to use BLM fee facilities such as campsites at no cost in conjunction with their duties. Volunteers may not be furnished Government quarters without charge.

.7 Unreimbursed Expenses. The BLM currently has no authority to reimburse volunteers for travel, meals, or other incidental personal expenses. However, volunteers may deduct unreimbursed expenses such as for local transportation, meals, travel expenses, lodging, uniforms, supplies, and the mileage rate allowed by the Internal Revenue Service (IRS) for the operation of a personal automobile for volunteer work, as deductible contributions on Federal income tax returns. A copy of the volunteer agreement should be retained by the volunteer and may be used to support this claim. The IRS sets an annual ceiling on volunteer expenses which can be claimed. IRS booklet No. 526, *Income Tax Deductions for Contributions,* provides information on this subject and is available, at no charge, from IRS Taxpayer Assistance Offices.

.8 Records and Reports.

.81 Records. Volunteers project records and individual volunteer records must be maintained in the normal Bureau records system under paperwork management code 1114 at the office where the agreement is signed. A Privacy Act notification (Bureau sign S-137) must be attached to the file or files cabinet.

.82 Reports.

A. *Annual Report.* Officials utilizing volunteer services must submit an annual summary of the project evaluation required in .42 for the preceding fiscal year to their State Office Volunteer Program Coordinator by November 1 of each year (Washington Offices and others not within a State Office organization must submit their reports directly to the Washington Office Volunteers Program Coordinator by December 1 of each year). The State Office Volunteer Program Coordinator must forward a State report of volunteer utilization to the Washington Office Volunteer Program

B. *Volunteer Groups.* Organized groups may provide volunteer services under a single volunteer agreement for each sponsoring organization. The agreement must contain these key elements:

1. The name, telephone number (with area code), and address (with zip code) of the sponsoring organization;

2. A list of all of the persons in the group who are volunteering their services along with the dates on which or within which the work will be performed. This list must include names, telephone numbers (including area code), and addresses (including zip codes) of each volunteer's next of kin or other person to be notified in case of injury of accident;

3. A description of the work to be performed. This section establishes the parameters of the volunteer's status for tort claims and workers' compensation;

4. The following statements:

a. The above described work will be contributed to the Bureau of Land Management without compensation.

b. The work performed by participants will not confer on them, their employees, or officers, the status of Federal employees except for purposes of the Federal Tort Claims Act which provides them protection from liability incurred while serving as a volunteer within the scope of this agreement and the provisions of workers' compensation laws which provide compensation for injuries incurred while serving as a volunteer within the scope of this agreement.

c. We will provide the Bureau of Land Management with a list of participants and workhours or work-days contributed to accomplish the work described above;

d. We will obtain parent's or guardian's consent for each individual under 18 years of age and will comply with child labor laws.

e. ..... (name) is hereby designated to serve as our liaison; with the Bureau of Land Management in day-to-day operations under this agreement;

f. We understand that we or the Bureau of Land Management may cancel this agreement at any time by notifying the other party in writing;

5. Signature and address of the designated group liaison and the date signed;

6. Any pertinent remarks;

7. A statement of acceptance on behalf of the BLM including the name, address, and telephone number of the project leader or supervisor;

8. The signature and title of the authorized BLM officer (see .04C) and the date signed; and

9. Agreement terminated by ..... (signature) on ..... (date).

.42 Evaluation.

A. *Projects.* Each volunteer project, when completed, is evaluated by the project supervisor and the results documented (see .81). The following must be included:

1. Benefits to BLM. Include quantity and quality of work and an estimate of the approximate dollar value based on average work-month costs or other criteria;

2. Benefits to the volunteers. These can come in many intangible forms such as education, career enhancement, or merely the feeling of a job well done; and

3. Cost of the project to BLM including materials, supervision, and other costs.

B. *Personnel.*

1. Performance of volunteers serving individually is documented and evaluated on Form 1400-90, Performance Improvement and Position Review. Unsatisfactory performance may result in termination of the volunteer's agreement.

2. Performance of groups is evaluated and documented by memorandum to the authorizing officer.

3. Certificates or letters of appreciation and/or other expressions of acknowledgement and appreciation should be given to volunteers when appropriate.

Coordinator by December 1 of each year. Items to be included in the report are:

1. Total number of volunteers who served during the fiscal year;

2. Total number of hours that volunteers worked;

3. Brief description of the work or projects undertaken;

4. Notable savings realized through the use of volunteers including the value of the work accomplished;

5. Summary of the costs of volunteer activities; and

6. Recommendations, suggestions, or other comments which can improve the usefulness of the volunteer program, for either the BLM or the volunteer.

B. *Other Reports.* Other required reports, such as job documentation reports (BLM Manual Section 1632), accident reports (BLM Manual Section 1400-810), must also be completed as required.

IN REPLY REFER TO:

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
222 North 32nd Street
P.O. Box 30157
Billings, Montana 59107

4120.6 (931)
(961)

NOV 10 1981

Instruction Memorandum No. MT-82-50
Expires: 9/30/82

To: District Managers

From: State Director

Subject: Benefit-Cost Procedures

The Bureau method of estimating benefits and costs of public rangeland investments was developed in 1976 (WO IM No. 76-455) and subsequently modified several times. Because of the numerous mathematical calculations involved, a computer program was developed at MSO to facilitate the hundreds of B/C analyses required for our first two range EIS's.

The current administration is very sensitive about economic analysis for all proposed project work. Accordingly, the WO rangeland management division will be addressing this issue in FY82. In the interim, we have been cleared by the WO to update the procedures for Montana. The following procedures shall apply to all B/C analyses relative to proposed rangeland investments.

BENEFITS

The benefits to be estimated include changes in:

(1) Livestock forage
(2) Calf crop and calf weights*
(3) Hunter-fisherman days and nonhunter visitor days

* Benefits of increased herd size are included in the value of increased livestock forage. This eliminates the double-counting problem.

A data-input form is enclosed to facilitate the computer processing of B/C analysis. First, enter the number of AUMs presently authorized for the entire allotment, both BLM and non-BLM. Then, project the percent AUM change without and with the proposed AMP. Be sure to designate whether the percent change is positive (+) or negative (-). Also estimate the number of years required to reach these changes in projected AUM levels. This is the buildup period.

The value of an AUM will not be set at the commercial value. Rather, separate values for gaining an AUM and avoiding the loss of an AUM will be entered. These values will be provided to you by MSO for each range EIS area. The reason for this change is that recent economic analysis

of ranch operations in Montana show a marked difference in the value of an AUM gained versus avoiding the loss of one AUM. For example, in the Prairie Pothole area the value of an AUM gained is $6.55, while the value of avoiding the loss of one AUM is $13.42.

The number of cows in the breed herd should be that number specified on the grazing permit or lease. Remember to include the total number authorized in the allotment, both on BLM and non-BLM lands. An estimate can be made by dividing the present allotment AUMs by the grazing season.

Estimate percent calf crop at weaning and calf weights present situation, without and with the proposed AMP. These estimates must be realistic and tied to the resource base. For example, if a majority of the range is in good condition and stable, it would not be realistic to estimate that calf weight would decrease substantially "without" the AMP. Also, it would not be realistic to estimate a large increase in calving percentage with only land treatment. MSO will provide you with net return per calf and average calf price per pound figures based on economic reports for your specific range EIS area.

Hunter-fisherman days and nonhunter visitor days are estimated on the basis of changes in habitat quantity and quality. The change is to be based on an estimate of recreation days with and without the AMP, regardless of whether the activity takes place on public lands. There is no change here from the initial Bureau procedures. A column has been added for unit values, however, for your input. Enclosure 1 lists the previously established unit values which are to be used unless you can justify any changes. MSO is currently involved in a contract designed to update these wildlife unit values. They will be made available to you upon completion of the contract.

COSTS

Proposed new construction, operation and maintenance costs are entered on the reverse side of the data input form. Enclosure 2 lists these costs by type of project for your consideration. Enter costs for each of your proposed projects, either from the enclosed list or based on costs which more accurately fit your situation. Also, be sure to indicate the number of years of useful project life or replacement years.

Only new projects proposed to implement the AMP need be shown by units. This is a change from the 1976 Bureau procedures, wherein both with and without data were used. The rationale for the change is that we are interested only in the costs of implementing the AMP. Operation and maintenance costs of existing projects, for example, would continue to occur under any alternative.

Additional implementation costs are entered for supervision, monitoring and livestock handling days. The costs per day are included in Enclosure 2 for your consideration.

These procedures are designed to provide rapid processing of data at the field level. It will allow you to more effectively use economics as a decisionmaking tool. You are encouraged to delete and substitute projects so that an awareness is gained as to the resulting B/C ratio and net benefits. The procedures were developed by Don Waite, Duane Whitmer and Don Johnson. Your key contact for any questions is Don Waite (961).

M. D. Pafford

2 Enclosures
Encl. 1-Unit Value List
Encl. 2-Cost List

Distribution
Director (220) 1 (w/o encl.)
SCD (D-559A) 3 (w/o encl.)
RAH's 1 (w/encl.)
SD's Staff 1 (w/o encl.)

BENEFIT — COST ANALYSIS

DATA INPUT

Name of Allotment	Allot. #	D.O. Code	R.A. Code	P.U. Code

Allotment Base Data	Unit Values	Present Situation	Without AMP	With AMP
Percent change — Build-up period			(+)(-) ___% ___Yrs.	(+)(-) ___% ___Yrs.
AUMs	Butte / Lewistown & Miles City			
Value of avoiding the loss of 1 AUM	13.42 | 16.95			
Value of gaining 1 AUM	6.55 | 9.37			
Cows (Number in breed herd)				
Calves				
% Calf crop, at weaning				
Net return per calf	100			
Calf weights				
Avg. calf price per lb.	.72			
Hunter-Fisherman Days				
01 Mule deer	24			
02 White-tail deer	24			
03 Antelope	41			
04 Elk	43			
05 Bighorn sheep	139			
06 Upland game birds	6			
07 Geese	12			
08 Ducks	6			
09 Fishing (cold water)	10			
10 Fishing (warm water)	6			
11 Non-Hunter Visitor Days	A-35 6			

Appendix 11 cont.

PROPOSED NEW CONSTRUCTION, OPERATION and MAINTENANCE COSTS

CODE	Type of Project	Initial Const. Cost	Annual O/M Cost	Replacement Years	Proposed with AMP (units)			
					BLM		Rancher	
					Const.	O/M	Const.	O/M
1	Fence (mi.)	$2,000	$15	$25				
2	Cattleguard (ea.)	1,700	20	15				
3	Reservoir (ea.)	1,800	50	20				
4	Spring (ea.)	1,800	50	15				
5	Pipeline (ft.)	1.50	.005	20				
6	Stock Tank (ea.)	450	10	25				
7	Well (ea.)	3500	30	30				
8	Catchment (ea.)	13,500	135	7				
9	Contour scalping (ac.)	15	–	50				
10	Sage spray (ac.)	14	–	25				
11	Plow and seed (ac.)	30	–	30				
12	Prescribed burn (ac.)	2.50	–	25				
13	Type IV crossing (ea.)	500	50	15				
14	Fence removal (mi.)	400	–	–				
15								
16								
17								
18								
19								
20								
	Additional Implementation Costs		Value Per Day					
21	Supervision days		100					
22	Monitoring days		100					
23	Lvst. handling days		100					

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GLOSSARY

ALLOTMENT. An area of land where one or more livestock operators graze their livestock. Allotments generally consist of BLM lands but may also include state owned and private lands. An allotment may include one or more separate pastures. Livestock numbers and seasons of use are specified for each allotment.

ALLOTMENT MANAGEMENT PLAN (AMP). A written program of livestock grazing management, including supportive measures if required, designed to attain specific management goals in a grazing allotment.

ANIMAL UNIT MONTH (AUM). A standardized measurement of the amount of forage necessary for the complete sustenance of one animal for 1 month; also, the measurement of the privilege of grazing one animal for 1 month.

BROWSE. To browse is to graze a plant; also, browse (noun) is the tender shoots, twigs and leaves of trees and shrubs often used as food by cattle, deer, elk and other animals.

CANOPY COVER. The percentage of ground covered when a polygon drawn around the extremities of the undisturbed canopy of each plant is projected on the ground and all such projections on a given area are added together.

COMPACTION. The process of packing firmly and closely together; the state of being so packed, e.g., mechanical compaction of soil by livestock or vehicular activity. Soil compaction results from particles being pressed together so that the volume of the soil is reduced. It is influenced by the physical properties of the soil, moisture content and the type and amount of compactive effort.

CONTOUR FURROW. A plowed strip to fit the contour of the land for the purpose of water retention.

CRITICAL WILDLIFE HABITAT. The area of land, water and airspace required for the normal needs and survival of an endangered species.

DEFERMENT. The withholding of livestock grazing until a certain stage of plant growth is reached.

DEFERRED GRAZING. Discontinuance of livestock grazing on an area for a specified period of time during the growing season to promote plant reproduction, establishment of new plants or restoration of the vigor by old plants.

DEFERRED ROTATION GRAZING. Discontinuance of livestock grazing on various parts of a range in succeeding years, allowing each part to rest successively during the growing season. This permits seed production, establishment of new seedlings or restoration of plant vigor. Two, but more commonly three or more, separate pastures are required. Control is usually ensured by fencing but may be accomplished by herding on sheep ranges.

ECOLOGICAL RANGE CONDITION CLASSES. Four classes used to express the degree to which the composition of the present plant community reflects that of climax. They are:

"Range Condition Class"	Percentage of Present Plant Community That is Climax For the Range Site
Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

"High-Good Condition" 65%-75% of climax.
A condition score of 65-75.

"Low-Good Condition" 51%-64% of climax.
A condition score of 51-64.

ENDANGERED OR THREATENED SPECIES. Determined for plants and animals by one or a combination of the following factors:

1. The present or threatened destruction, modification or curtailment of a species habitat or range.
2. Over-utilization of a species for commercial, sporting, scientific or educational purposes.
3. Disease or predation of the species.
4. The inadequacy of existing regulatory mechanisms.
5. Other natural or human caused factors affecting a species' continued existence.

ENVIRONMENTAL IMPACT STATEMENT (EIS). A written analysis of the impacts on the environment of a proposed project (e.g., a grazing program).

EROSION. The wearing away of the land surface by running water, wind, ice or other geological agents.

FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (FLPMA). Public Law 94- 579, October 21, 1976, often referred to as the BLMs "Organic Act," which provides the majority of the BLM's legislated authority, direction, policy and basic management guidance.

FORB. A broadleafed herb that is not grass, sedge or rush.

GRAZING DISTRICT. Established by the Taylor Grazing Act, grazing districts are administrative subdivisions of the rangelands under jurisdiction of the BLM.

GRAZING SYSTEM. The manipulation of livestock grazing to accomplish a desired result.

GROUND COVER. Vegetation, mulch, litter, rocks, etc.

HABITAT. A specific set of physical conditions that surround a species, group of species or a large community. In wildlife management, the major constituents of habitat are considered to be food, water, cover and living space.

HUNTER DAY. One person hunting during any part of one day.

LAND TREATMENT. All methods of artificial range improvement and soil stabilization such as reseeding, brush control (chemical and mechanical), pitting, furrowing, waterspreading, etc.

LIVESTOCK OPERATION. The management of a ranch or farm so that a significant portion of the income is derived from the continuing production of livestock.

MANAGEMENT FRAMEWORK PLAN (MFP). A planning decision document that establishes, for a given planning area, land use allocations, coordination guidelines for multiple use, and management objectives to be achieved for each class of land use or protection. It is the BLM's land use plan. An MFP is prepared in three steps: (1) resource recommendations, (2) impact analysis and alternative development, and (3) decision making.

MECHANICAL TREATMENTS. Treatment by mechanical means of an area of range including contour furrowing, pitting, plowing and seeding, chiseling, scalping, water spreaders, etc. to accomplish desired objectives.

MITIGATION MEASURES. Methods or procedures committed to by BLM for the purpose of reducing or lessening the impacts of an action.

MULTIPLE USE. Balanced management of the various surface and subsurface resources, without permanent impairment of the productivity of the land, that will best meet present and future needs.

PLANT SUCCESSION. The process of vegetative development whereby an area becomes successively occupied by different plant communities of higher ecological orders.

PUBLIC LANDS. Any land and interest in land (outside of Alaska) owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management.

PUBLIC PARTICIPATION. Part of BLM's planning system that provides the opportunity for citizens as individuals or groups to express local, regional, and national perspectives and concerns in the rule making, decision making, inventory and planning processes for public lands. This includes public meetings, hearings, or advisory boards or panels that may review resource management proposals and offer suggestions or criticisms for the various alternatives considered.

RANGE CONDITION. The present state of vegetation of a range site in relation to the climax plant community of that site. It is an expression of the relative degree to which the kinds, proportions and amounts of plants in a plant community resemble that of the climax plant community for that site. Range condition is basically an ecological rating of the plant community. Air-dry weight is the unit of measure used in comparing the composition and production of the present plant community with that of the climax community.

REST ROTATION GRAZING. An intensive system of management where grazing is deferred on various parts of the range during succeeding years, allowing the deferred part complete rest for 1 year. Two or more units are required. Control by fencing is usually necessary on cattle range but may be obtained by herding on sheep ranges.

RUNOFF. The water that flows on the land surface from an area in response to rainfall or snowmelt. As used in this EA, runoff from an area becomes streamflow when it reaches a channel.

SEDIMENT. Soil, rock particles and organic or other debris carried from one place to another by wind, water or gravity.

SEDIMENT YIELD. The total amount of sediment given up by a watershed over a specified time period, usually a year. Ordinarily it is expressed as tons, acre feet or cubic yards of sediment per unit of drainage area per year.

SHRUB. A low woody plant, usually with several stems, that may provide food and/or cover for animals.

SOIL. The unconsolidated mineral material on the immediate surface of the earth that serves as a natural medium for the growth of land plants.

SOIL LOSS. The detachment of material from the land surface by raindrop impact and its subsequent removal by prechannel or overland flow. Synonymous with "Sheet Erosion."

SOIL MAP. A map showing the distribution of soil series or other soil mapping units in relation to the prominent physical and cultural features of the earth's surface.

SOIL SERIES. The basic unit of soil classification, being a subdivision of a family and consisting of soils which are essentially alike in all major profile characteristics except in the texture of the "A" horizon (or surface layer).

SPECIES OF SPECIAL INTEREST OR CONCERN. Species not yet listed as "endangered or threatened" but whose status is being reviewed because of their widely dispersed populations or their restricted ranges. A species whose population is particularly sensitive to external disturbance.

THREATENED SPECIES. A species that the Secretary of Interior has determined to be likely to become endangered within the forseeable future throughout all or most of its range. See also "Endangered or Threatened Species."

TOPOGRAPHY. The exact physical features and configuration of a place or region; the detailed and accurate description of the landforms of a place or region.

VEGETATION (GROUND) COVER. The percent of land surface covered by all living vegetation (and remnant vegetation yet to decompose) within 20 feet of the ground.

VISUAL RESOURCE(S). The land, water, vegetation and animals that comprise the scenery of an area.

WATER QUALITY. The chemical, physical and biological characteristics of water with respect to its suitability for a particular use.

WATERSHED. All lands which are enclosed by a continuous hydrologic drainage divide and lie upslope from a specified point on a stream.

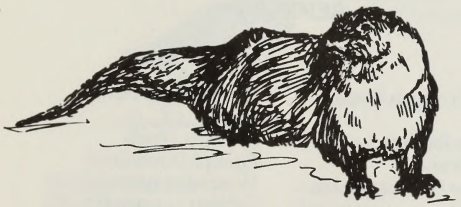
WATER YIELD. The quantity of water derived from a unit area of watershed.

WILDLIFE SPECIES IN THE LEWISTOWN DISTRICT

MAMMALS

Common Name	Scientific Name
Masked Shrew	*Sorex cinereus*
Merriam Shrew	*Sorex merriami*
Preble Shrew	*Sorex preblei*
Long-Legged Bat	*Myotis volans*
Little Brown Bat	*Myotis lucifugus*
Yuma Bat	*Myotis yumanensis*
Little Long-eared Bat	*Myotis evotis*
Small-footed Myotis	*Myotis leibii*
Big Brown Bat	*Eptesicus fuscus*
Hoary Bat	*Lasiurus cinereus*
Townsend's Big-eared Bat	*Plecotus townsendii*
Silver-Haired Bat	*Lasionycteris noctivagar*
Raccoon	*Procyon lotor*
Short-tailed Weasel	*Mustela erminea*
Long-tailed Weasel	*Mustela frenata*
Least Weasel	*Mustela rixosa*
* Black-footed Ferret	*Mustela nigripes*
Wolverine	*Gulo luscus*
Stripped Skunk	*Mephitis mephitis*
Spotted Skunk	*Spilogale putorius*
Badger	*Taxidea Taxus*

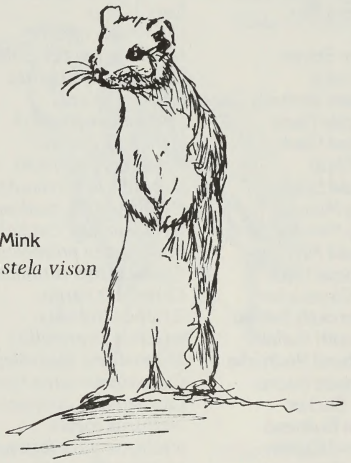
River Otter *Lutra canadensis*



Red Fox	*Vulpes fulva*
Coyote	*Canis latrans*
* Gray Wolf	*Canis lupus*
Cougar	*Felis concolor*
Canada Lynx	*Lynx canadensis*
Bobcat	*Lynx rufux*
Wyoming Pocket Mouse	*Perognathus fasciatus*
Ord Kangaroo Rat	*Dipodomys ordi*
Beaver	*Castor canadensis*

* Endangered

Northern Grasshopper Mouse	*Onychomys leucogaster*
Western Harvest Mouse	*Reithrodontomys megalotis*
Western Deer Mouse	*Peromyscus maniculatus*
White-footed Mouse	*Peromyscus leucopus*



Mink
Mustela vison

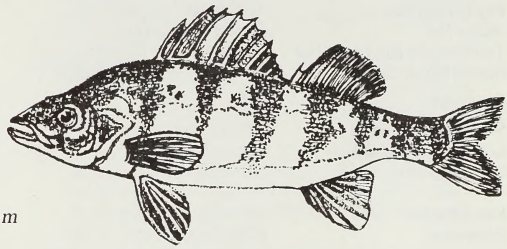
Columbian Ground Squirrel	*Spermophilus columbianus*
Richardson Ground Squirrel	*Spermophilus richardsonii*
Thirteen-line Ground Squirrel	*Spermophilus tridecemlineatus*
Black-tailed Prairie Dog	*Cynomys ludovicianus*
Least Chipmunk	*Eutamias minimus*
Northern Pocket Gopher	*Thomomys talpoides*
Bushy-tailed Woodrat	*Neotoma cinerea*
Meadow Vole	*Microtus pennsylvanicus*
Prairie Vole	*Microtus ochrogaster*
Sagebrush Vole	*Lagurus curtatus*
Muskrat	*Ondatra zibethica*
Montane Vole	*Microtus montanus*
House Mouse	*Mus musculus*
Western Jumping Mouse	*Zapus princeps*
Meadow Jumping Mouse	*Zapus hudsonius*
Whitetail Jackrabbit	*Lepus townsendi*
Mountain Cottontail	*Sylvilagus nuttalli*
Desert Cottontail	*Sylvilagus auduboni*
Porcupine	*Erethizon dorsatum*
Rocky Mountain Elk	*Cervus canadensis*
Mule Deer	*Odocoileus hemionus*
White-tailed Deer	*Odoncoileus virginianus*
Pronghorn Antelope	*Antilocapra americana*

FISH

Common Name	Scientific Name
Paddlefish	*Polyodon spathula*
Goldeye	*Hiodon alosoides*
Lake Whitefish	*Coregonus clupeaformis*
*Rainbow Trout	*Salvelinus gairdner*
*Brook Trout	*Salvelinus fontinalis*
Northern Pike	*Esox lucius*
*Carp	*Cyprinus carpio*
Golden Shiner	*Notemigonus crysoleucas*
Pearl Dace	*Semotilus margarita*
Northern Redbelly Dace	*Phoxinum eos*
Finescale Dace	*Phoxinus neogaeus*
Flathead Chub	*Hybopsis gracilis*
Lake Chub	*Couesius plumbeus*
Emerald Shiner	*Notropis atherinoides*
Brassy Minnow	*Hybognathus hankinsoni*
Silvery Minnow	*Hybognathus nuchalis*
Flathead Minnow	*Pimephales promelas*
Longnose Dace	*Rhinichthys cataractae*
River Carpsucker	*Carpoides carpio*
Smallmouth Baffalo	*Ictiobus bubalus*
Bigmouth Buffalo	*Ictiobus cyprinellus*
Shorthead Redhorse	*Moxostoma macrolepidotum*
Longnose Sucker	*Catostomus catostomus*
White Sucker	*Catostomus commersoni*
*Black Bullhead	*Ictalurus melas*
Channel Catfish	*Ictalurus punctatus*
Stone Cat	*Noturus flavus*
Burbot (Ling)	*Lota lota*
Brook Stickleback	*Culaea inconstans*
*Pumpkinseed	*Lepomis gibbosus*
*Bluegill	*Lepomis mackochirus*
*Largemouth Bass	*Micropterus salmoides*
*White Crappie	*Pomoxis annularis*
*Black Crappie	*Pomoxis nigromaculatus*
Sauger	*Stizostedion canadense*
*Walleye	*Stizostedion vitreum*
Iowa Darter	*Etheostoma exile*
Mottled Sculpin	*Cottus bairdi*
*Smallmouth Bass	*Micropterus dolomieui*
Mountain Whitefish	*Prosopium williamsoni*
Freshwater Drum	*Aplodinotus grunniens*
Shovelnose Sturgeon	*Scaphirhynchus platorynchus*
*Brown Trout	*Salmo trutta*
*Goldfish	*Carassius auratus*
Plains Minnow	*Hybognathus placitus*
Blue Sucker	*Cycleptus elongatus*
Mountain Sucker	*Catostomus platyrhynchus*
*Mosquitofish	*Gambusia affinis*
*White Bass	*Roccus chrysops*
American Smelt	*Osmerus Mordax*

AMPHIBIANS

Common Name	Scientific Name
Plains Spadefoot	*Scaphiopus bombifrons*
Great Plains Toad	*Bufo cognatus*
Dakota Toad	*Bufo hemiopheys*
Rocky Mountain Toad	*Bufo woodhousei*
Boreal Chorus Frog	*Psendacris triseriata*
Leopard Frog	*Rana pipiens*
Tiger Salamander	*Ambystoma tigrinum*



*Yellow Perch
Perca flavescens

REPTILES

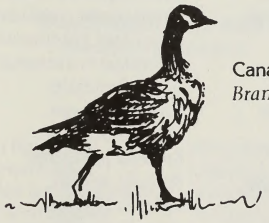
Common Name	Scientific Name
Prairie Rattlesnake	*Crotalus viridis*
Bull Snake	*Pituophis catenifer*
*Plains Hognose Snake	*Heterodon nasicus*
Racer	*Coluber constrictor*
Western Garter Snake	*Thamnophis elegans*
Plains Garter Snake	*Thamnophis radix*
Common Garter Snake	*Thamnophis sirtalis*
Painted Turtle	*Chrysemys picta*
*Western Spiny Softshell	*Trionyx spiniferus*
Short-horned Lizard	*Phrynosoma douglassi*
Sagebrush Lizard	*Sceloporus graciosus*
*Milk Snake	*Lampropeltis doliata*
*Common Snapping Turtle	*Chelydra serpentina*

*Introduced species.

BIRDS

Common Name	Scientific Name
Common Loon	*Gavia immer*
Red-Necked Grebe	*Podiceps grisegena*
Horned Grebe	*Podiceps auritus*
Eared Grebe	*Podiceps caspicus*
Western Grebe	*Aechmophus occidentalis*
Pied-Billed Grebe	*Podilymbus podiceps*
White Pelican	*Pelecanus erythrorhynchos*
Double-Crested Cormorant	*Phalacrocorax auritus*
Snowy Egret	*Leucophoyx thula*
Black-Crowned Night Heron	*Nycticorax nycticorax*
American Bittern	*Botaurus lentiginosus*
White-Faced Ibis	*Plegadis chihi*
Whistling Swan	*Olor columbianus*
White-Fronted Goose	*Anser albifrons*
Snow Goose	*Chen caerulescens*
Ross' Goose	*Chen rossii*
Mallard	*Anas platyrhynchos*
Black Duck	*Anas rubripes*
Gadwall	*Anas strepera*
Pintail	*Anus acuta*
Green-Winged Teal	*Anas carolinensis*
Blue-Winged Teal	*Anas discors*
Cinnamon Teal	*Anas cyanoptera*
American Wigeon	*Anas americana*

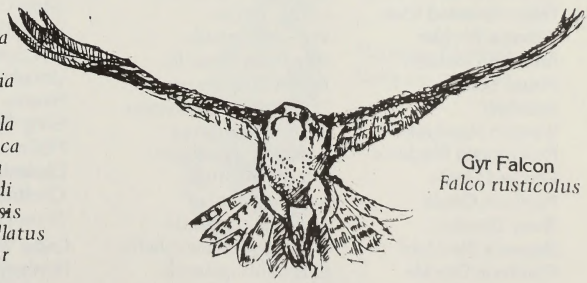
Great Blue Heron
Ardea herodias



Canada Goose
Branta canadensis

Goshawk	*Accipiter gentilis*
Sharp-Shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperi*
Red-Tailed Hawk	*Buteo jamaicensis*
Broad-Winged Hawk	*Buteo platypterus*
Harlan's Hawk	*Buteo harlani*
Swainson's Hawk	*Buteo swainsoni*
Rough-Legged Hawk	*Buteo lagopus*
Ferruginous Hawk	*Buteo regalis*
Golden Eagle	*Aquila chrysaetos*
Bald Eagle	*Haliaeetus leucocephalus*
Marsh Hawk	*Cirus cyaneus*
Prairie Falcon	*Falco mexicanus*
Peregrine Falcon	*Falco peregrinus*

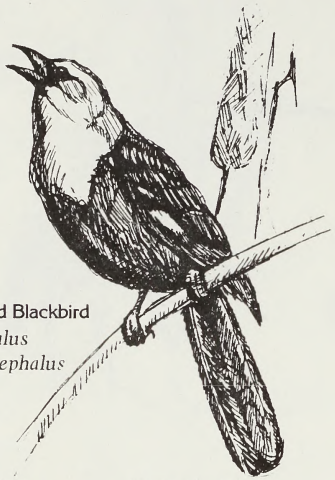
Northern Shovelor	*Anas clypeata*
Wood Duck	*Aix sponsa*
Redhead	*Aythya americana*
Ring-Necked Duck	*Aythya collaris*
Canvasback	*Aythya valisimeria*
Lesser Scaup	*Aythya affinis*
Common Goldeneye	*Bucephala clangula*
Barrow's Goldeneye	*Bucephala islandica*
Bufflehead	*Bucephala albeola*
White-Winged Scoter	*Melanitta deglandi*
Ruddy Duck	*Oxyura jamaicensis*
Hooded Merganser	*Lophodytes cucullatus*
Common Merganser	*Mergus merganser*
Red-Breasted Merganser	*Mergus serrator*



Gyr Falcon
Falco rusticolus

BIRDS CONT.

Scientific Name	Common Name
Western Bluebird	*Sialia mexicana*
Townsend's Solitaire	*Myadestes townsendi*
Blue-Grey Gnatcatcher	*Polioptila caerulea*
Golden-Crowned Kinglet	*Regulus satrapa*



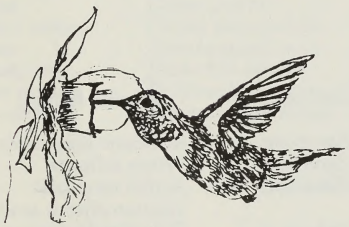
Yellow-Headed Blackbird
Xanthocephalus xanthocephalus

Red-Eyed Vireo	*Vireo olivaceus*
Warbling Vireo	*Vireo gilvus*
Black & White Warbler	*Mniotilta varia*
Tenessee Warbler	*Vermivora peregrina*
Orange-Crowned Warbler	*Vermivora celata*
Yellow Warbler	*Dendroica petechia*
Yellow-Rumped Warbler	*Dendroica coronata*
Blackpoll Warbler	*Dendroica striata*
Palm Warbler	*Dencroica pinus*
Ovenbird	*Seiurus aurocapillus*
Northern Waterthrush	*Seiurus noveboracensis*
Mourning Warbler	*Oporornis philadelphia*
McGillivray's Warbler	*Oporornis tolmiei*
Common Yellowthroat	*Geothlypis trichas*
Yellow-Breasted Chat	*Icteria virens*
Wilson's Warbler	*Wilsonia pusilla*
American Redstart	*Setophaga ruticilla*
House Sparrow	*Passer domesticus*
Bobolink	*Dolichonyx oryzivorus*
Western Meadowlark	*Sturnella neglecta*
Red-Winged Blackbird	*Agelaius phoeniceus*
Orchard Oriole	*Icterus spurius*
Northern Oriole	*Icterus galbula*
Rusty Blackbird	*Euphaga carolinus*
Brewer's Blackbird	*Euphaga cyanocephalus*
Common Grackle	*Quiscalus quiscula*
Brown-Headed Cowbird	*Molothrus ater*

Common Name	Scientific Name
Starling	*Sturnus vulgaris*
Solitary Vireo	*Vireo solitarius*
Ruby-Crowned Kinglet	*Regulus calendula*
Water Pipit	*Motacilla spinoletta*
Sprague's Pipit	*Anthus spragueii*
Bohemian Waxwing	*Bombycilla garrulus*
Western Tanager	*Piranga lucoviciana*
Rose-Breasted Grosbeak	*Pheucticus ludovicianus*
Black-Headed Grosbeak	*Pheucticus melanocephalus*
Blue Grosbeak	*Guiraca caerulea*
Evening Grosbeak	*Hesperiphona vespertina*
Pine Grosbeak	*Pinicola enucleator*
Indigo Bunting	*Passerina cyanea*
Dickcissil	*Spiza americana*
Lazuli Bunting	*Passerina amoena*
Purple Finch	*Carpodacus purpureus*
Gray-Crowned Rosy Finch	*Leucosticte tephrocotis*
Black Rosy Finch	*Leucosticte atrata*
Hoary Redpoll	*Carduelis hornemanni*
Common Redpoll	*Carduelis flammea*
Pine Siskin	*Carduelis pinus*
American Goldfinch	*Carduelis tristis*
Red Crossbill	*Loxia curvirostra*
Rufous-Sided Towhee	*Pipilo erythrophthalmus*
Green-Tailed Towhee	*Pipilo chlorurus*
Lark Bunting	*Calamospiza melanocorys*
Savannah Sparrow	*Passerculus sandwichensis*
Baird's Sparrow	*Ammodramus bairdii*
Le Conte's Sparrow	*Ammospiza leconteii*
Sharp-Tailed Sparrow	*Ammospiza caudacuta*
Vesper Sparrow	*Pooecetes gramineus*
Lark Sparrow	*Chondestes grammacus*
Dark-Eyed Junco	*Junco hyemalis*
Gray-Headed Junco	*Junco caniceps*
Tree Sparrow	*Spizella arborea*
Chipping Sparrow	*Spizella passerina*
Clay-Colored Sparrow	*Spizella pallida*
Brewer's Sparrow	*Spizella breweri*
Field Sparrow	*Spizella pusilla*
Harris' Sparrow	*Zonotriehia querula*
White-Crowned Sparrow	*Zonotrichia leucophrys*
White-Throated Sparrow	*Zonotrichia albicollis*
Fox Sparrow	*Passerella iliaca*
Lincoln's Sparrow	*Melospiza lincolnii*
Swamp Sparrow	*Melospiza georgiana*
Song Sparrow	*Melospiza melodia*
McCown's Longspur	*Calcarius mccownii*
Lapland Longspur	*Calcarius lapponicus*
Chestnut-Collared Longspur	*Calcarius ornatus*
Snow Bunting	*Plectrophenax nivalis*
Cedar Waxwing	*Bombycilla cedrorum*
Northern Shrike	*Lanius excubitor*
Loggerhead Shrike	*Lanius ludovicianus*

BIRDS CONT.

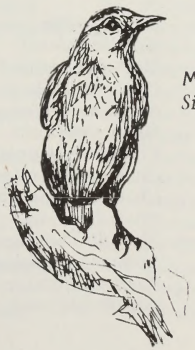
Common Name	Scientific Name
Rock Dove	*Columba livia*
Yellow-Billed Cuckoo	*Coccyzus americanus*
Black-Billed Cuckoo	*Coccyzus erthropthalmus*
Barn Owl	*Tyro alba*
Screech Owl	*Otus asio*
Great Horned Owl	*Bubo virginianus*
Snowy Owl	*Nyctea scandiaca*
Burrowing Owl	*Athene cunicularia*
Long-Eared Owl	*Asio otus*
Short-Eared Owl	*Asio flammeus*
Saw-Whet Owl	*Aegolius acadicus*
Poor-Will	*Phalaenoptilus nuttallii*
Common Nighthawk	*Chordeiles minor*
White-Throated Swift	*Aeronautes saxatilis*
Chimney Swift	*Chaetura pelagica*



Ruby-Throated Hummingbird
Archilochus colubris

Belted Kingfisher	*Mergaceryle alcyon*
Common Flicker	*Colaptes auritus*
Red-Headed Woodpecker	*Melanerpes erythrocephalus*
Lewis Woodpecker	*Melanerpes lewis*
Yellow-Bellied Sapsucker	*Sphyrapicus varius*
Hairy Woodpecker	*Picoides villosus*
Downy Woodpecker	*Picoides pubescens*
Eastern Kingbird	*Tyrannus tyrannus*
Western Kingbird	*Tyrannus verticalis*
Scissor-tailed Flycatcher	*Muscivora forficata*
Say's Phoebe	*Sayornis saya*
Alder Flycatcher	*Empidonax alnorum*
Willow Flycatcher	*Empidonax trailli*
Least Flycatcher	*Empidonax minimus*
Dusky Flycatcher	*Empidonax oberholseri*
Western Flycatcher	*Empidonax difficilis*
Western Wood Pewee	*Contopus sordidulus*
Horned Lark	*Eremophila alpestris*
Violet-Green Swallow	*Tachycineta thalassina*

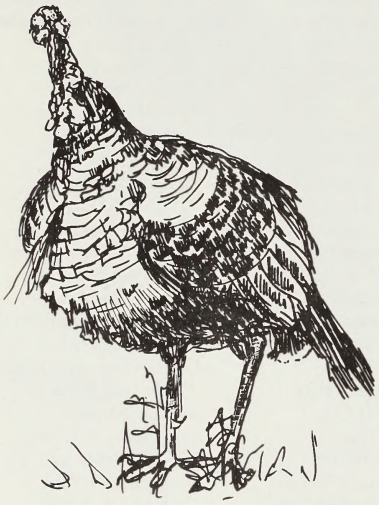
Common Name	Scientific Name
Tree Swallow	*Iridoprocne bicolor*
Bank Swallow	*Riparia riparia*
Rough-Winged Swallow	*Stelgidopteryx ruficollis*
Barn Swallow	*Hirundo rustica*
Cliff Swallow	*Petrochelidon pyrrhonota*
Purple Martin	*Progne subis*
Blue Jay	*Cyanocitta cristata*
Pinyon Jay	*Gymnorhinus cyanocephalus*
Gray Jay	*Perisoreus canadensis*
Black-Billed Magpie	*Pica pica*
Clark's Nutcracker	*Nucifraga columbiana*
Common Crow	*Corvus brachyrhynchos*
Common Raven	*Corvus corax*
Black-Capped Chickadee	*Parus atricapillus*
Mountain Chickadee	*Parus gambeli*
Dipper	*Cinclus mexicanus*
White-Breasted Nuthatch	*Sitta carolinensis*
Red-Breasted Nuthatch	*Sitta canadensis*
Brown Creeper	*Certhia familiaris*
House Wren	*Troglodytes aedon*
Long-Billed Marsh Wren	*Cistothorus palustris*
Short-Billed Marsh Wren	*Cistothorus platensis*
Rock Wren	*Salpinctes obsoletus*
Mockingbird	*Mimus polyglottus*
Gray Catbird	*Dumetella carolinensis*
Brown Thrasher	*Taxostoma rufum*
Sage Thrasher	*Oreoscoptes montanus*
American Robin	*Turdus migratorius*
Varied Thrush	*Ixoreus naevius*
Wood Thrush	*Hylocichla mustelina*
Hermit Thrush	*Catharus guttata*
Swainson's Thrush	*Catharus ustulata*
Gray-Cheeked Thrush	*Catharus minimus*
Veery	*Catharus fuscescens*
Eastern Bluebird	*Sialia sialis*



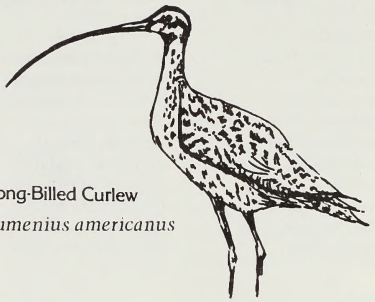
Mountain Bluebird
Sialia currucoides

BIRDS CONT.

Common Name	Scientific Name
Osprey	*Pandion haliaetus*
American Kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
Sharp-Tailed Grouse	*Pedioecetes phasianellus*
Sage Grouse	*Centrocercus urophasianus*
Ring-Necked Pheasant	*Phasianus colchicus*
Blue Grouse	*Dendragapus obscuris*
Ruffed Grouse	*Bonasa umbellus*



Turkey *Meleagris gallopauo*



Long-Billed Curlew
Numenius americanus

Common Name	Scientific Name
Upland Sandpiper	*Bartramia longicauda*
Solitary Sandpiper	*Tringa solitaria*
Spotted Sandpiper	*Actitis macularia*
Willett	*Catoptropherus semipalmatus*
Greater Yellowlegs	*Tringa melanoleucus*
Lesser Yellowlegs	*Tringa flavipes*
Pectoral Sandpiper	*Calidris melanotos*
White-Rumped Sandpiper	*Calidris fuscicollis*
Baird's Sandpiper	*Calidris bairdii*
Least Sandpiper	*Calidris minutilla*
Western Sandpiper	*Calidris mauri*
Short-Billed Dowitcher	*Limnodromus griseus*
Long-Billed Dowitcher	*Limnodromus scolopaceus*
Stilt Sandpiper	*Micropalma himantopus*
Semipalmated Sandpiper	*Calidris pusilla*
Marbled Godwit	*Limosa fedoa*
Sanderling	*Calidris alba*
American Avocet	*Recurvirostra americana*
Black-Necked Stilt	*Himantopus mexicanus*
Red Phalarope	*Phalaropus fulicarius*
Wilson's Phalarope	*Steganopus tricolor*
Northern Phalarope	*Lobipes lobatus*
Herring Gull	*Larus argentatus*
California Gull	*Larus californicus*
Ring-Billed Gull	*Larus delawarensis*
Franklin's Gull	*Larus pipixcan*
Bonaparte's Gull	*Larus philadelphia*
Forster's Tern	*Sterna forsteri*
Common Tern	*Sterna hirundo*
Black Tern	*Chlidonias niger*
Mourning Dove	*Zenaidura macroura*

Gray Partridge	*Perdix perdix*
Sandhill Crane	*Grus canadensis*
Whooping Crane	*Grus americana*
Virginia Rail	*Rallus limicola*
Sora	*Porzana carolina*
American Coot	*Fulica americana*
Mountain Plover	*Charadrius montana*
Semipalmated Plover	*Charadrius semipalmatus*
Piping Plover	*Charadrius melodus*
Killdeer	*Charadrius vociferus*
American Golden Plover	*Pluvialis dominica*
Black-Bellied Plover	*Squatarola squatarola*
Ruddy Turnstone	*Arenaria interpres*
Common Snipe	*Capella gallinago*

VEGETATION SPECIES IN THE LEWISTOWN DISTRICT

GRASS AND GRASSLIKE

Common Name	Scientific Name	Common Name	Scientific Name
Carolina foxtail	*Alopecuras carolinianus*	Russian wildrye	*Elymus junceus*
Redtop	*Agrostis alba*	Idaho fescue	*Festuca octoflora*
Bluebunch wheatgrass	*Agropyron spicatum*	Six weeks fescue	*Festuca octoflora*
Crested wheatgrass	*Agropyron cristatum*	Foxtail barley	*Hordeum jabatum*
Thickspike wheatgrass	*Agropyron dasystachyum*	Spikerush	*Juncus spp*
Western wheatgrass	*Agropyron smithii*	Prairie junegrass	*Koeleria cristata*
Slender wheatgrass	*Agropyron trachycaulum*	Plains muhly	*Muhlenbergia cuspidata*
Little bluestem	*Andropogon scoparius*	Mat muhly	*Muhlenbergia richardsonis*
Red threeawn	*Aristida longiseta*	Indian ricegrass	*Oryzopsis hymenoides*
American sloughgrass	*Bechmannia syzigachne*	Big bluegrass	*Poa ampla*
Blue grama	*Bouteloua gracilis*	Canby bluegrass	*Poa cambyi*
Smooth brome	*Bromus inermis*	Kentucky bluegrass	*Poa pratensis*
Japanese brome	*Bromus japonicus*	Sandberg bluegrass	*Poa secunda*
Cheatgrass	*Bromus tectorum*	Tumblegrass	*Schedonnardus panculatus*
Bluejoint	*Calamgrostis canadensis*	Bullrush	*Scirpus spp*
Plains reedgrass	*Calamagrostis montanensis*	Squirrel tail	*Sitanian hystrix*
Prairie sandreed	*Calamovilfa longfolia*	Dropseed	*Sporobolus spp*
Sedge	*Carex spp*	Alkali sacaton	*Sporobolus arioides*
Threadleaf sedge	*Carex filifolia*	Alkali cordgrass	*Spartina gracilis*
Elk sedge	*Carex geyeri*	Needleandthread	*Stipa comata*
Needleleaf sedge	*Carex stenophylla*	Green needlegrass	*Stipa viridula*
Hair grass	*Deschampsia spp*	Porcupine grass	*Stipa spartea*
Inland saltgrass	*Distichlis stricta*	Common wheat	*Triticum aestivum*
Barnyard grass	*Echinochloa crusgalli*	Broadleaf cattail	*Typha spp.*
Canada wildrye	*Elymus canadensis*	Nodding smartweed	*Polygonum muhlenbergii*
		Sago pond weed	*Potamogeton pectinatus*

HALF SHRUB AND FORB

Wavyleaf thistle	*Cirsium undulatum*	Yarrow	*Achillea lanulosa*
Field bindweed	*Convolvulus arvensis*	Western yarrow	*Archillea millefolium*
Bull thistle	*Cirsium vulgare*	Kinnikinnick	*Arctostaphylos uva-ursi*
Narrowleafed collomia	*Collomia linearis*	Broadleaf water plantain	*Aliasma plantago acquatica*
Bastard toadflax	*Comandra umbellata*	Nodding onion	*Allium cernuum*
Minerscandle	*Cryptantha bradburiana*	Wild onion	*Allium textile*
Hawksbeard	*Crepis spp*	Field pussytoes	*Antennaria neglecta*
Larkspur	*Delphinium spp*	Rose pussytoes	*Antennaria rosea*
Shootingstar	*Dodecatheon conjugens*	Fringed sagewort	*Artemisia frigida*
Horsetail	*Equisetum spp*	Green sagewort	*Artemisia dracunculus*
Plains (western) wallflower	*Erysimum asperum*	Cudweed sagewort	*Artemisia ludoviciana*
Fleabane	*Erigeron spp*	Heartleaf arnica	*Arnica sororia*
Fernleaf fleabane	*Erigeron compositus*	Spreading pasqueflower	*Anemone patens*
Buckwheat	*Erigonium lagopus*	Loco weed	*Astragalus spp*
Eriogonum (buckwheat)	*Eriogonum spp*	Pursh loco (wooly pod)	*Astragalus purshii*
Low fleabane	*Erigeron pumilus*	Green milkweed	*Asclepias Viridiflora*
Leafy spurge	*Euphorbia esula*	Milkweed species	*Asclepias spp*
Yellowbell	*Fritillaria pudica*	Aster spp	*Aster spp*
Brown-eyed Susan	*Gaillardia aristata*	Many flowered aster	**Aster ericoides*
Bedstraw	*Gallium boreale*	Oregon grape	*Berberis repens*
Scarlet gaura	*Gaura coccinea*	Roundleaf harebell	*Campanula rotundifolia*
White geranium	*Geranium richardsonii*	Field chickweed	*Cerastium arvense*
Prairiesmoke	*Geum triflorum*	Lambsquarter	*Chenopodium album*
American locorice	*Glycyrrhiza lepidota*	Hairy goldenaster	*Chrysopsis villosa*
Curly cup gumweed	*Grindelia squarrosa*	Thistle	*Cirsium spp*
Broom snakeweed	*Gutierrezia sarothrae*	Canada thistle	*Cirsium arvense*
Stickseed	*Hackelia spp*		

* Species unlisted in Standardized Plant Names for Montana

HALF SHRUB and FORB cont.

Common Name	Scientific Name	Common Name	Scientific Name
Halogeton	*Halogeton glormeratus*	Aquatic buttercup	*Ranunculus spp.*
Sun flower	*Halianthella spp*	Buttercup	*Ranunculus abortivus*
Annual sunflower	*Helianthus annuus*	Sagebrush buttercup	*Ranunculus glaberrimus*
Stiff sunflower	*Helianthus rigidus*	Prairie coneflower	*Ratibida columnifera*
Stemless hymenoxys	*Hymenoxys acaulis*	Raspberry	*Ropippa calycina*
Hymenoxys	*Hymenoxys spp*	Dock	*Rumex spp*
Pingue humenoxys	*Hymenoxys richardsonii*	Arrowhead	*Sagittaria latifolia*
Poverty weed	*Iva axillaris*	Russian thistle	*Salsola kali tenuuiflora*
Kochia	*Kochia americana*	Small clubmoss	*Selaginella densa*
Belvedere summercypress	*Kochia scoparia*	Grounsel	*Senecio spp*
Stickseed	*Lappula spp*	Tembleweedmustard	*Sisymbrium spp*
Dotted gay feather	*Liatris punctata*	Goldenrod	*Solidago spp*
Perennial flax	*Linum perenne*	Missouri goldenrod	*Solidago missouriensis*
Biscuitroot	*Lomatium foeniculaceum*	Stiff goldenrod	*Solidago rigida*
Bigseed lomatium	*Lomatium macrocarpum*	Scarlet globemallow	*Sphaeralcea coccinea*
Lupine	*Lupinus*	Woundwort (mint)	*Stachys palustis*
Skeletonweed	*Lygodesmia spp*	Common dandelion	*Taraxacum officinale*
Rush skeletonweed	*Lygodesmia juncea*	Fanweed	*Thlaspi arvense*
Pink pincushioncactus	*Mammillaria vivipara*	Mountain thermopsis	*Thermopsis montana*
White sweetclover	*Melilotus alba*	Common salsify	*Tragopogon dubius*
Yellow sweetclover	*Melilotus officianalis*	Mustard family	*Typha latifolia*
Alfalfa	*Medicago sativa*	American vetch	*Vicia americana*
Brookmint	*Meatha canadensis*	Yellow prairie violet	*Viola nuttallii*
Microseris	*Microseris spp*	Cocklebur	*Xanthium spp*
Daggerhilt (gumbo weed)	*Monolepsis nuttalliana*	Deathcamas	*Zygadenus spp*
Wildparsley	*Musineon divaricatum*	Hoods phlox	*Phlox hoodii*
Forgetmenot	*Myosotis spp*	Wooly plantian	*Plantago patagonica*
Gumbo lily	*Oenothera caespitosa*	Spindle plantain	*Plantago patagonica*
Plains pricklypear	*Opuntia polyacantha*	(Spiny indianwheat)	*spinulosa*
Yellow owl clover	*Orthocarpus luteau*	(Wooly indianwheat)	*gnaphaloides*
Crazyweed	*Oxytropis spp*	Cinquefoil	*Potentilla spp*
White pointloco	*Oxytropis sericea*	Gland cinquefoil	*Potentilla glandulosa*
Penstemon	*Penstemon spp*	Scurfpea	*Psoralea spp*
White penstemon	*Penstem albidus*	Silverleaf scurfpea	*Psoralea argophylla*
White prairie clover	*Petalostemon candidus*	Common breadroot scurfpea	*Psoralea esculenta*
Purple prairie clover	*Petalostemon purpurcum*		

SHRUBS AND TREES

Subalpine fir	*Abies lasiocarpa*	Utah juniper	Juniperus osteosperma
Box elder	*Acernegundo*	Rocky Mountain juniper	Juniperus scopulorum
Juneberry	Amelanchier alnifolia	Englemann spruce	Picea elgelmannii
Black sage	Artemisia arbuscula var. nova	White bark pine	Pinus albicaulis
Silver sagebrush	Artemisia cana	Limber pine	Pinus flexilus
Big sagebrush	Artemisia tridentata	Lodgepole pine	Pinus contorta latifolia
Shadscale saltbush	Atriplix confertifolia	Ponderosa pine	Pinus ponderosa
Nuttall saltbush	Atriplix nattallii	Cottonwood	Populus spp
Siberian peatree	Caragana arborescens	Plains cottonwood	Populus sargentii
Curleaf mountain mahogany	Cercocarpus ledifolius	Pin cherry	Prunus pennsylvanica
Rubber rabbitbrush	Chrysothamnus nauseosus	Chokecherry	Prunus virginiana
River hawthorn	Cratargus rivularis	Douglas fir	Pseudotsuga menziesii glauca
Douglas rabbitbrush	Chrysothamnus viscidiflorus	Skunkbrush	Rhus trilobata
Green ash	Fraxinus pennsylvanica	Wild rose	Rosa spp
Winterfat	Eurotia lanata	Willow	Salix spp
Broom snakeweed	Gurierrezia sarothrae	Greasewood	Sarcobatus vermiculatus
Common juniper	Juniperus communis	Buffaloberry	Sheperdia argentea
Creeping juniper	Juniperus horizontalis	Western snowberry	Symphoricarpos occidentalis
		Yucca	Yucca glauca

Source: BLM, 1980.